FAA Aviation News

SAFETY FIRST FOR GENERAL AVIATION

January/February 2009
Volume 48/Number 1

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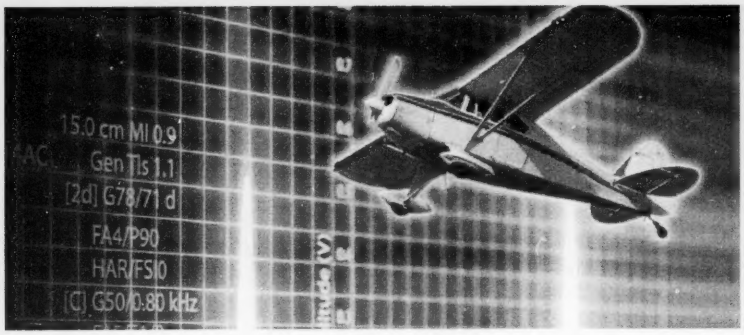
Getting Your Special Issuance Medical

A Medical Emergency in the Sky

Truth or Consequences

Clear Skies, Clear Head?

Are You Approved for Ice?



In this issue, we focus on the FAA's approach to key aeromedical issues, including authorization for special issuance medicals and other "fit to fly" topics.

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U.S. Department of Transportation
Federal Aviation Administration

ISSN: 1057-9648
January/February 2009
Volume 48/Number 1

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The FAA's Flight Standards Service, General Aviation and Commercial Division's Plans and Programs Branch (AFS-805) publishes *FAA Aviation News* six times each year in the interest of aviation safety. The magazine promotes safety by discussing current technical, regulatory, and procedural aspects affecting the safe operation and maintenance of aircraft. Although based on current FAA policy and rule interpretations, all material herein is advisory or informational in nature and should not be construed to have regulatory effect.

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The Office of Management and Budget has approved the use of public funds for the printing of *FAA Aviation News*.

The magazine is available on the Internet at: www.faa.gov/news/aviation_news.

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DIRECTOR, FLIGHT STANDARDS SERVICE

Jumpseat

Unsung Heroes: Building Aviation's Future

Nestled along the South Fork of the Licking River is my hometown, Cynthiana, Kentucky. Cynthiana boasts several factories, 6,000 residents, and a public-use airport, where my cousin, Bobby Craft, is the board chairman. Cynthiana-Harrison County Airport (0I8) is a small airport two miles south of Cynthiana tucked in a bend of the Licking River with a 3,800-foot runway and a handful of hangars.

Bobby, like many others, is a huge booster of aviation. He is active in Young Eagles®, an Experimental Aircraft Association™ program where kids get a ride in an aircraft volunteers rent or own. It's a great program: More than a million young people have received rides thanks to volunteer pilots in 90 countries.

Since 2000, each year some 200 young Kentuckians are introduced to aviation at two events at the Cynthiana airport. Bobby proudly reports that one of his first Young Eagles returned this year with a newly minted pilot certificate. Helping young people get a taste of aviation and get a sense that their futures can soar is essential to aviation's future. What Bobby, his wife Jeana, and countless other Young Eagles volunteers are doing is even more important: They build character. The Young Eagles flights help many kids overcome their fears and feel pride and self-confidence when they come back after that first flight.

There's no age limit at Cynthiana airport. Last summer, Jeana coordinated an event for "Silver Eagles" to give rides to residents of the Cedar Ridge Health Campus. She wanted to give senior citizens an opportunity that they would not have had without such a program. Some of the seniors had never been in an airplane; others hadn't flown in more than 50 years. One participant was 100 years old.

Cynthiana airport isn't standing still. It is moving forward to ensure the airport continues to play an important role in the community. Bobby acquired funding to build a new terminal building (including classrooms) and parking lot. Yet, Bobby is not alone. There are many more people like him across the country who are doing great things for aviation.

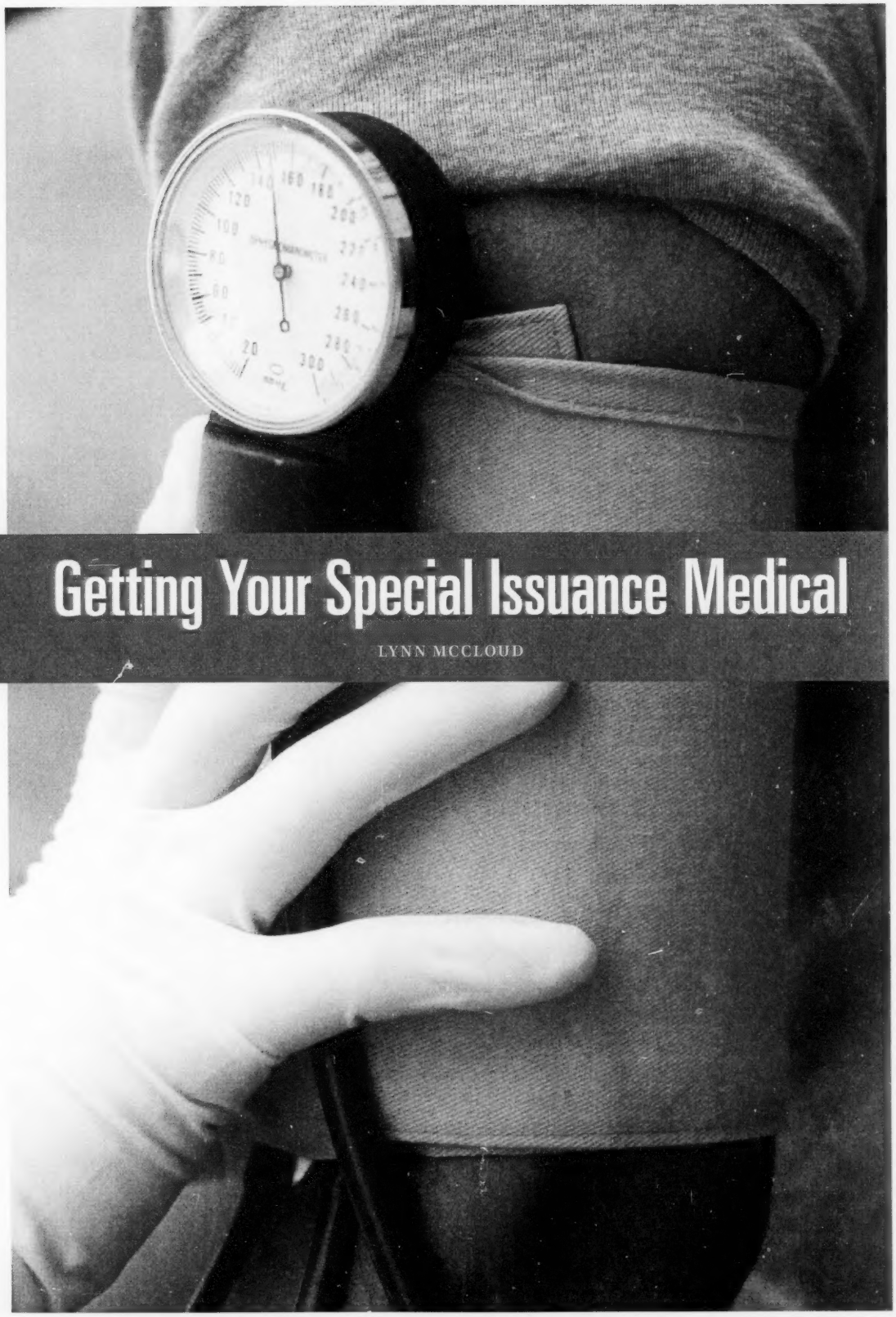
We in the federal government work visibly to enable the adventure and commerce of aviation without compromising safety. Many in Washington, DC, get publicly recognized for their contributions. Yet, there are thousands of unsung heroes all around the nation who humbly give of their own time and expense to enhance aviation's future.

There's no age limit at Cynthiana airport.

Yes, I am extremely proud of what my cousin is doing for aviation. I am also proud of the many other unsung heroes who are making a tremendous difference for aviation. Thank you all for what you are doing to build a better and stronger future for all of us.

Gordon Davis photo

Pilot John Hufford takes Cynthia Sue Craft for a ride.



Getting Your Special Issuance Medical

LYNN MCCLOUD

While David Letterman has his "Top Ten" lists, FAA's Dr. Warren Silberman has just three items on his list of advice for pilots seeking medical certification. "One, find a good aviation medical examiner (AME). Two, find a good aviation medical examiner. And, three, find a good aviation medical examiner."

With more than 11 years as manager of FAA's Aerospace Medical Certification Division (AMCD), Silberman knows from experience that the quality of the AME makes the biggest difference. It can make the difference in a routine medical exam going more smoothly and it can make all the difference in the world if you have a medical condition that requires a special issuance authorization.

A large percentage of airmen, about 95 percent, receive medical certificates at or within a few days of their medical examination. The other 5 percent require further review. At his frequent appearances at popular air shows, such as EAA AirVenture®, the most frequent questions pilots ask Silberman are about obtaining a special issuance third-class medical certificate, which allows pilots to fly with medical conditions FAA determines to be acceptable risks.

"Stick with it," is always the doctor's response. Of the 430,000 applications for medical certification each year, Silberman says, "It is only 0.1 percent of airmen who are denied." Of those, he says, "a significant number ultimately get their medical."

The majority of people who get denied just give up, Silberman explains. "They fail to provide the documentation that FAA requests." He notes that very few conditions are "show stoppers," unlike not too long ago when a medical certificate was denied for a number of medical conditions. Today, pilots are flying with heart transplants, permanent cardiac pacemakers, and diabetes mellitus on insulin.

FAA issues two types of waivers. One is a Statement of Demonstrated Ability (SODA) for a medical condition, e.g., monocular vision, which usually does not change over time. SODAs generally require a special medical flight test. The second, an Authorization for Special Issuance, is for a medical condition that may change, such as treated coronary artery disease.

In pursuing a medical waiver, there are several things pilots can do to help themselves. Silberman says the first thing to do: "Get smarter about your condition." There are a number of helpful Web sites and other resources to learn about specific medical conditions. The other advice, which is not surprising to come from a physician, is to get, and stay, healthy. "Of course, starting healthy is always a good policy," Silberman notes. "The minute anyone decides to be a pilot, my advice is to take care of your own engines and practice preventive maintenance."

If you have a medical issue, learn as much as you can about the condition. Then, put together a package that addresses FAA requirements, which you can learn about on the FAA Web site. (www.faa.gov/about/office_org/headquarters_offices/avs/offices/aam/ame/guide/) Next, make a copy for yourself, and take it to your AME. "Just because a physician is an AME doesn't mean he cannot also be a pilot advocate," Silberman adds. "AMEs should be very knowledgeable about different medical conditions and they should help airmen collect the right information and put together a package of what we need to review regarding the case."

"Stick With It." Of the 430,000 applications for medical certification each year only 0.1 percent are denied. Of those airmen a significant number ultimately get their medical certification.

Do not send old information, Silberman cautions. There's a medical reason that the guidance is to get your package to FAA within 90 days of the time that you notify FAA of the medical condition. This way the information and testing is not stale.

"We then attempt to 'time' the airman's renewal process," Silberman says. "In general, it will be 12 months from the date of the examination for third class airmen." Airmen are strongly advised to make sure they provide exactly what FAA requests. "There is always a valid aeromedical reason for the evaluations and testing that we request," Silberman adds. "Not providing us with the proper testing or having the treating physician perform the test in a

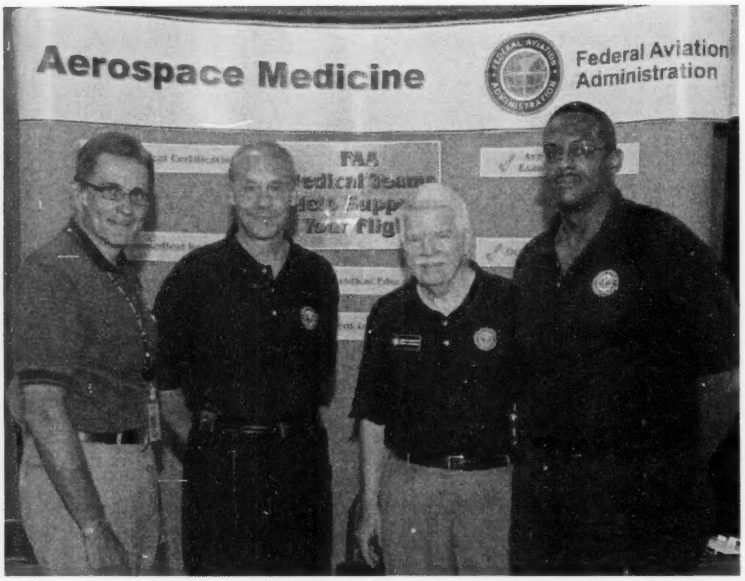


Photo courtesy of Laurie Zaleski

The medical face of the FAA at a recent EAA AirVenture™: (left to right) Manager, Aerospace Medical Certification Division Warren Silberman, D.O.; Federal Air Surgeon Fred Tilton, M.D.; Regional Flight Surgeon Nestor Kowalsky, M.D.; and Flight Surgeon Marvin Jackson, M.D.

General Aviation: Who Needs a Medical Certificate?

Private, recreational, and student pilots are required to hold a third-class airman medical certificate, which is generally valid for five years if the airman is under age 40 and valid for two years if age 40 or older. A second-class airman medical certificate, which is required for commercial, non-airline duties, is valid for one year.

Obtaining a medical certificate requires an examination by an FAA-designated Aviation Medical Examiner (AME). As explained on the FAA Web site (http://www.faa.gov/licenses_certificates/medical_certification/), "You must contact an AME of your choosing, schedule an appointment, complete an official FAA application form, and undergo a physical examination. If you meet the appropriate medical standards, the AME will issue you a medical certificate.

The FAA Web site also includes a directory of FAA-approved AMEs at http://www.faa.gov/pilots/amelocator/.

different way may result in delays and having to repeat the test the way we requested in the first place."

The package goes from the AME to Silberman's division at the Civil Aerospace Medical Institute (CAMI) in Oklahoma City. There it is scanned and sent to one of the AMCD's 35 legal instrument examiners who reviews the case in consultation, as needed, with one of seven staff physicians until a waiver is issued or the application is denied. Silberman often looks at cases as do consultants the AMCD calls on to review certain cases, e.g., cardiac cases.

According to the Federal Laboratory Consortium, a nationwide network of more than 250 federal laboratories and centers, "The FAA medical certification program is the most flexible, pilot-friendly, and safety-oriented medical certification system around the world, and represents a role model for other countries."

The scanning technology, additional staff, and a complete revision of the division's business processes have helped AMCD speed up its response time. Several years ago, backlogs and delays were the norm. Now, processing time averages 30 days from when the documentation package is received to when the pilot is notified of the decision. More than reducing the backlog, which has been a positive result from introducing technology and adding staff, "Our goal is to try to keep the airman flying," Silberman says.

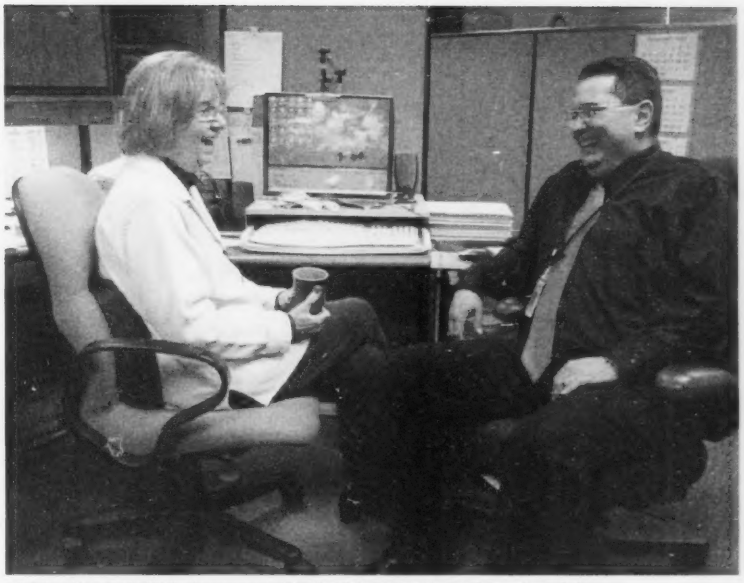
The point of the special issuance is to take a close look at risk and make an informed medical decision based on that risk. "We have gotten better at really looking to see about the chance that a condition would result in sudden incapacitation," explains Silberman. In most cases, a person with one of the potentially disqualifying conditions, e.g., heart disease resulting in myocardial infarction, bypass, or stents, can still fly. But, the airman will need to provide regular follow-up testing to demonstrate to the FAA he/she is safe to fly for the time period that the examination is in effect.

"It's all about risk management," says Silberman. "We can let you fly with certain medical conditions, but we will also monitor how you're

doing and check whether your condition is stable." The point is not to put the pilot or the public at risk.

Silberman's division looks at more than 430,000 cases a year. It is technical, painstaking, and process-oriented work. Yet, the staff turnover is low and dedication high. Silberman says he speaks for his entire staff when he says, "The most satisfying thing about our job is to help pilots get their ticket back."

Lynn McCloud photo



Shirley Scott of FAA's Aerospace Medical Certification takes a break from reviewing electrocardiograms to chat with supervisor John Simmons.

How to Find a Good Aviation Medical Examiner

According to Richard F. Jones, M.D., M.P.H., "The medical examination is important to ensure, to the best of our ability, that the airman is unlikely to have a medically-related event that could cause a safety risk during the time the certificate is valid."

Jones heads FAA's Aerospace Medical Education Division, which is responsible for policy development, planning, evaluation, and administration of the approximately 4,500 AMEs appointed to conduct physical examinations and issue FAA medical certificates to about 620,000 civil airmen throughout the United States and in 93 countries worldwide. His division develops aeromedical education programs for pilots and AMEs and also produces publications and training materials to promote aeromedical safety.

"A good AME is thorough, but fair," Jones says. "It may be easier to identify a bad AME," he continues, "who could be a physician who minimizes or does not record important medical information, performs an incomplete examination, suggests the airman modify or change history items, or who is cavalier toward the process.

"The best AMEs, on the other hand, require evaluation of all conditions that could make the pilot unsafe."

In short, your health and your safety are serious topics. The best counsel is to take your medical certification seriously. FAA provides an AME locator guide at: http://www.faa.gov/pilots/amelocator/.

For More Information

FAA Pilot Medical Certification Questions & Answers
http://www.faa.gov/licenses_certificates/medical_certification/faq/

Information on coronary artery disease, high blood pressure, and insulin-treated diabetes mellitus
http://www.faa.gov/licenses_certificates/medical_certification/specialissuance/

Pilot medical videos and brochures
http://www.faa.gov/about/office_org/headquarters_offices/avs/offices/aam/med_pilots/

The Federal Air Surgeon's Medical Bulletin, primarily written for aviation medical examiners, contains useful information about medical conditions and case studies
http://www.faa.gov/library/reports/medical/fasmb/

Aircraft Owners and Pilots Association (AOPA) Online Medical Certification Center (members only)
See www.aopa.org/

Experimental Aircraft Association's (EAA) Aeromedical Advisory Program (members only)
See www.eaa.org/

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With FAA MedXPress, you can get your medical certificate faster than ever before.
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With this online form you can complete FAA Form 8500-8 in the privacy and comfort of your home and submit it before scheduling your appointment.
The new service is free and can be found at:
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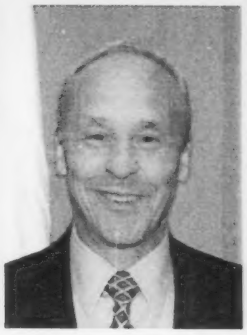
Aeromedical Advisory

FREDERICK E. TILTON, M.D.
FAA FEDERAL AIR SURGEON



At Least Eight Hours

Happy New Year! If new year's resolutions are part of your holiday tradition, chances are good that at least some of the promises you've made involve healthier living. Since good health is so fundamental to being a safe pilot, we are supporting those resolutions by focusing this issue on medical topics most relevant to aviators. Given that alcohol often provides the cornerstone of holiday celebrations and social gatherings, this space is devoted to reviewing the many reasons that you should firmly resolve never to mix drinking with flying.

Hard Facts and Erratic Effects

Alcohol is a sedative, hypnotic, and addicting drug that quickly impairs judgment and leads to behavior that can easily contribute to, or cause, accidents. Its toxic effects, which vary considerably from person to person, are influenced by gender, body weight, rate of consumption (time), and total amount consumed. Consider these facts:

- The average healthy person eliminates pure alcohol at a fairly constant rate—about 1/3 to 1/2 ounces of pure alcohol per hour.
- Even after complete elimination of all of the alcohol from the body, there are undesirable effects—hangover—that can last 48 to 72 hours following the last drink. Symptoms commonly associated with a hangover are headache, dizziness, dry mouth, stuffy nose, fatigue, upset stomach, irritability, impaired judgment, and increased sensitivity to bright light. A pilot with these symptoms would certainly not be fit to safely operate an aircraft.

Alcohol and Aviation

The majority of adverse effects produced by alcohol relate to the brain, eyes, and inner ear—three crucial organs to a pilot.

- Brain effects include impaired reaction time, reasoning, judgment, and memory.
- Visual symptoms include eye muscle imbalance, which leads to double vision and difficulty focusing.
- Inner ear effects include dizziness and decreased hearing perception.

Pilots have shown impairment in their ability to perform even routine VFR flight tasks while under the influence of alcohol, regardless of individual flying experience. The number of serious errors dramatically increases as your blood alcohol level goes up. Some studies have shown diminished pilot performance with blood alcohol concentrations as low as 0.025 percent. If other variables (e.g., sleep deprivation, fatigue, medication use, altitude hypoxia, or flying at night or in bad weather) are present, the negative effects are significantly magnified.

Regulations and Recommendations

The use of alcohol and drugs by pilots is regulated by Title 14 Code of Federal Regulations section 91.17: No person may operate or attempt to operate an aircraft within eight hours of having consumed alcohol, while under the influence of alcohol, or with a blood alcohol content of 0.04 percent or greater. A more conservative approach is to wait 24 hours from the last use of alcohol before flying. This is especially true if intoxication occurred or if you plan to fly IFR. Also, consider the effects of a hangover. Eight hours from "bottle to throttle" does not mean you are in the best physical condition to fly or that your blood alcohol concentration is below the legal limits. Time is the only real solution and, ideally, every pilot should strive for total avoidance of alcohol in planning or accomplishing a flight. Lives are at risk if you drink and fly.

For more information, take a look at the alcohol and flying information brochure at http://www.faa.gov/pilots/safety/pilotsafetybrochures/.

Good health and safe flying!

Dr. Tilton received both an M.S. and a M.D. degree from the University of New Mexico and an M.P.H. from the University of Texas. During a 26-year career with the U.S. Air Force, Dr. Tilton logged more than 4,000 hours as a command pilot and senior flight surgeon flying a variety of aircraft. He currently flies the Cessna Citation 560 XL.

TOM CRUSE

Heart Attack!

A Medical Emergency in the Sky

It is a great day to fly: Low humidity, gentle winds, and an infinite sky. I am making a one-hour flight to Greenwood, Indiana, to pick up my brother and bring him back to Piqua, Ohio.

There is no other activity at Dayton-Wright Brothers Airport. I look down on the hangar before turning west. The top of the haze layer is around a thousand feet AGL, but it has little effect on visibility. The climb is smooth. I level off at 3,500 feet, set the autopilot, and study the many corn and grain fields below. I look forward to some quality "bonding" time with my brother on the return flight.

James Williams photo

The winds are on my nose, but the 90-plus knot groundspeed will still get me into Greenwood on time. I monitor Dayton approach and hear a controller comment that a lot of pilots are flying so they can "touch the sky" today. I feel a real kinship with my fellow pilots.

An Odd Feeling of Pain

Around the halfway point, I decide to monitor Indianapolis approach. All seems to be quiet. Suddenly, the center of my chest feels as if I have a three-inch log jamming into me. It starts with a low level of pressure, but rapidly grows to a very uncomfortable strain that radiates outward to my shoulders. It seems like a heart attack, but how could that be? I have recently undergone a significant set of tests, including an isotope stress test and the new calcium CT scan. By all accounts, my cardiovascular system is in great shape. I have been a jogger for many years and I watch what I eat. Yes, the results of my marginal blood lipids test and my slightly elevated blood pressure might be warning signs, but they did not disqualify me for a new third-class medical certificate. How can it be a heart attack?

The pain grows intense. I remove my headset and wipe the profuse sweat from my head. I am soaking from the waist up. I realize that I have to do something soon, as the pain intensity increases. Since I have just passed abeam the Connersville airport, it is an obvious place to land. I dial the Unicom frequency and begin to think about how I will get help when I land.

Abruptly and completely, the pain ends and my sweating stops. I let the autopilot continue toward Greenwood. I do not consider turning for home, even though the winds favor return over the continued flight. I am still focused on the mission of picking up my brother, but then I realize that I cannot allow him to fly with me after this experience. What to do? The indecision carries me on for several more minutes and miles until the Indianapolis skyline appears ahead.

This One Is Real

The pain begins again. As it grows, I finally admit that it really is a heart attack, which means I have to act now. On the Greenwood Unicom frequency I announce that I have a medical emergency and ask them to summon emergency medical personnel to meet my flight. An aircraft turning final for Runway 01 at Greenwood states that he will call 911.

With less than ten minutes out, the pain continues to grow. I am drenched again. It is getting harder to concentrate on flying, but I have started a slow descent. Time for the landing checklist. I announce that I will fly on cross-wind to the downwind for 01.

I am almost shouting at myself to maintain concentration on flying rather than on the intense pressure in my chest.

With my voice growing weaker, I announce that 8NG is turning downwind. Speed to 85 knots. Ten degrees of flaps. Trim. The numbers for 01 move abeam. Power to 1500 RPM. Turn base. Now final for 01, and ahead is the most beautiful runway I have ever seen.

Speed! I am below 60 knots. Add power. Be patient. I am almost shouting at myself to maintain concentration on flying rather than on the intense pressure in my chest. Patience. Let the speed bleed off. Patience. Let the aircraft settle...now add some power for cushion. Patience. The landing is smooth, but a bit fast. The nosewheel shimmies as it contacts the runway, but I don't care.

Left turn off the runway, right turn onto the taxiway. I see the lineman standing ready to guide me in. Next to him are the local fire department pumper and an ambulance. Lights flashing—for me. What a great sight.

Switches off. Double check systems are down. I open the door. The EMTs pull me out and put me on the stretcher. My brother looks anxious. I give someone the keys and instructions to secure the aircraft. Now in the ambulance, two EMTs are working me. I am being hooked to an IV on the right and an EKG setup on the left. The EMT on my left shouts, "Hit it, we have a real heart attack." I will always remember the "hit it, this is a real one" message.

It Could Have Been Worse

Five minutes later, I am in the emergency room. The emergency team takes control. I hear the cardiologist say, "Folks, let's prep him for surgery." This is followed rapidly by a catheter insertion into the right femoral artery. The cardiologist gets angio-

Author Tom Cruse, alive and well!

gram indications of a 99 percent block due to stenosis (plaque) in the left anterior descending heart artery, popularly known as the "widow maker."

I later learn that they deployed a stent at the key location and achieved 100 percent flow. Tests confirm that my heart has no permanent measurable damage. Except for the one other less critical location, my heart does not have significant arterial blockages. Best of all, there is agreement with the earlier finding that I have healthy arteries and no systemic heart issues.

Two days later, I am released from the hospital. I am alive and it is a beautiful day that makes me glad I am here to recover so I can fly and "touch the sky" again.

Tom Cruse has been a private pilot since 1975. He is a semi-retired research U.S. Air Force consultant and previously was a professor of mechanical engineering at Vanderbilt University. He now flies every two weeks with a flight instructor to stay IFR current and work toward a Commercial rating, which he plans to earn after getting his medical back.

The author's aviation medical examiner, Dr. Walter W. Keyes, Kettering, Ohio, provided the following brief patient history.

Mr. Cruse was a 65-year-old general aviation pilot with 800-plus hours of flying time when he was evaluated for palpitations in 2006. A Holter monitor test was negative. His palpitations abated with the reduction of caffeine intake. He had no family history of arteriosclerotic heart disease. His lipid panel was mildly abnormal, and he elected to control it by diet.

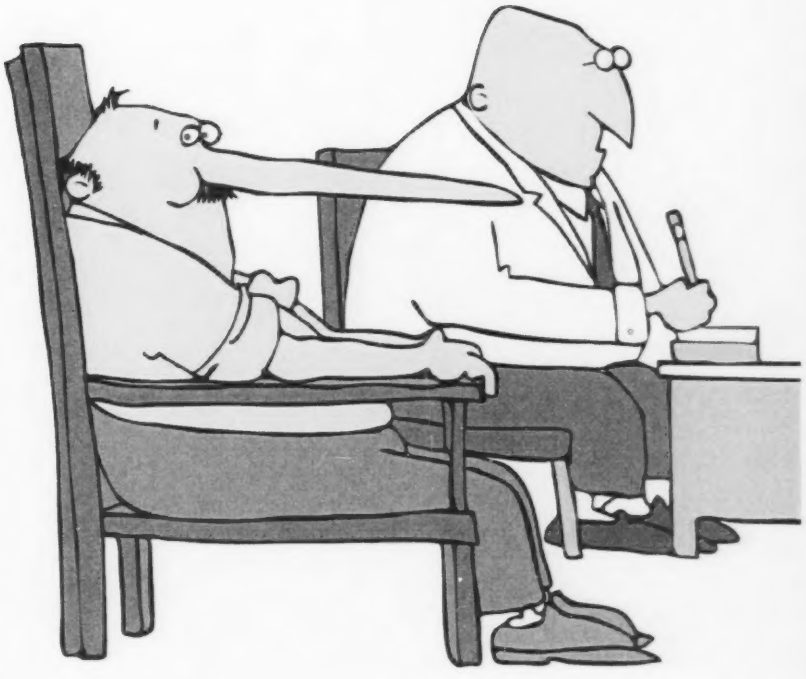
He was evaluated by a cardiologist in November 2007 for discomfort in the upper bronchial area, which would begin about 10 minutes into his jogging routine, but would spontaneously abate and did not prevent him from reaching his 1.5-mile goal.

More recently, he had stopped jogging due to Medullary Sponge Kidney (MSK) disease problems, but continued a vigorous walking program without chest pain. His workup included a stress cardiolite test, which showed no EKG change and a small fixed defect in the anterior wall; a 2D echo, which showed normal ejection fraction, mild tricuspid and mitral regurgitations; a CT scan for coronary artery calcification showing a score of 75.48 (mild plaque burden) predominately in the left anterior descending artery. He remained on a low dose of aspirin and seemed to be doing very well—until August 7, 2008.

SUSAN PARSON

Truth or Consequences

*Honesty Is the **Only** Policy in Medical Certification*



Pilots have a unique perspective. Flying lets us see the world in a different way, but our passion for aviation also gives many of us a different take on medical issues. For a non-pilot, a serious medical condition might first bring up fears of dying. For many pilots, though, diagnosis of the same medical condition might first arouse fears of not flying. There are aviators among us who may even perceive "not flying" as a fate worse than dying. That may be extreme, but most pilots can certainly empathize with the visceral "what-happens-to-my-medical" fear that shadows reporting any visit to a medical professional on the Airman Medical Application (otherwise known as Form 8500-8).

Truth...

Title 14 Code of Federal Regulations section 67.403 expressly prohibits falsification of the Airman Medical Application. Those who possess the skills and discipline to become pilots are generally people of integrity, people who would not normally think of themselves as dishonest. Still, fear can lead to unwise decisions. Even though most conditions can be certified, the loss-of-medical concern has prompted some pilots to be less than truthful on the Form 8500-8.

The numbers are troubling. In a study of every fatal accident between 1993 and 2003, FAA researchers found toxicological evidence that nearly 10 percent of the 4,143 pilots in the study had a serious medical condition. Of these, only 22 percent of the medical conditions had been reported on the Airman Medical Application form. A National Transportation Safety Board (NTSB) review of more than 20,000 aviation accidents since 1995 found 327 accidents in which impairment, incapacitation, or a medical condition were identified as causes or factors.

Just to be clear, there is no "gray area" on matters of medical certification. Form 8500-8 is a legal document. It must also be complete: Skipping Block 17 on the Form 8500-8, which asks about medications, will simply cause delays. Neither the aviation medical examiner (AME) nor the FAA's Aerospace Medical Certification Division can process an incomplete form.

Our whole system depends on the honesty of our applicants and your examinations.

...or Consequences

An applicant who knowingly misrepresents the facts on the Airman Medical Application form faces significant penalties. These can include revocation of pilot and medical certificates, fines up to $250,000, and even imprisonment for up to five years. Though offenses that merit imprisonment are rare, they are not unknown—and they usually stem from events in which someone suffered the consequence of an accident. Last year, for example, a judge sentenced a pilot to 16 months in prison and two years of probation for repeatedly lying about his

insulin-dependent diabetes on the Airman Medical Application form. In this case, the pilot experienced a diabetic seizure while flying an aircraft with four passengers aboard. The incident ended with no injuries due to the actions of a passenger who also happened to be a pilot trainee, but the penalties meted out to the pilot reflect the narrowly averted potential for disastrous consequences.

There is no "gray area" on matters of medical certification: The Airman Medical Application form is a legal document.

A pilot performing wolf survey flights for a state natural resources department was not as fortunate. The investigation into his fatal accident revealed no problems with the aircraft, but the pilot's medical conditions included both diabetes and congestive heart disease—both of which he had consistently failed to report on the Airman Medical Application form. The NTSB concluded that pilot incapacitation was the probable cause of this accident, with false information on the Form 8500-8 listed as a contributing factor.

Cover-Ups Don't Work

A final caution: It is something of a cliché that cover-up attempts are rarely successful, and that the consequences of a cover-up can sometimes be worse than those resulting from the original misdeed. Such is also the case in medical certification. Remember that your signature on the Form 8500-8 authorizes the FAA to search the National Driver's Registry for violations involving alcohol or illegal drugs, which means that failing to disclose a conviction for driving under the influence of alcohol (DUI), or driving while intoxicated (DWI) will put you at risk for sanctions far worse than those associated with reporting such violations. In the event of an accident or incident, there is also the possibility that toxicology reports, e.g., blood and urine samples, will clearly testify to a condition that the pilot failed to report.

In another instance, a cooperative effort between FAA and the Inspectors General from the Department of Transportation and the Social Security Administration called Operation Safe Pilot uncovered cases in which some pilots were fraudulently collecting 100 percent Social Security disability benefits and/or falsifying FAA medical applications. Measures implemented to address this issue included modifying the Form 8500-8 to add a question about receipt of any form of disability compensation and adding a notice stating that the pilot's signature authorizes the FAA to compare Form 8500-8 data with information from agencies that might be providing disability benefits.

For More Information

Medical certification home page on FAA Web site:
http://www.faa.gov/pilots/medical/

Pilot medical videos and brochures
http://www.faa.gov/about/office_org/headquarters_offices/avs/offices/aam/med_pilots/

Federal Air Surgeon's Medical Bulletin
http://www.faa.gov/about/office%5Forg/headquarters%5Foffices/avs/offices/aam/fasmb/

Strategies for Certification Success

Now that we've talked about what not to do, here are some steps you can take to enhance your prospects for honestly and legally getting your FAA medical certificate if your health is an issue.

Get the facts. Use the many resources available these days to learn as much as you can about the certification implications of your particular medical condition. A good place to start is the medical certification home page on the FAA's Web site (http://www.faa.gov/pilots/medical/). You can also access the FAA MedXpress form from this page.

Use your resources. The Aircraft Owners and Pilots Association (AOPA), the Experimental Aircraft Association (EAA), and many other aviation organizations provide medical certification information, advice, and advocacy for their members.

Resolve the problem. If your fact-finding research gives you any reason to believe that your medical issue might be disqualifying, delay your visit to the AME. Instead, work with your physician to resolve the issue.

Document, document, document. Your fact-finding research should include learning exactly what the FAA needs to certify your condition. As you work with your physician, be sure to have him/her document the specifics of your condition, your treatment, and your prognosis in precisely the format and level of detail that the FAA requires.

Doing your part will speed the FAA's evaluation and get you back into the cockpit as quickly as possible. Just remember, honesty is the only policy!

Susan Parson is a special assistant in Flight Standards Service's General Aviation and Commercial Division. She is an active general aviation pilot and flight instructor.

Flying on Medication

In 2003, a Florida pilot was killed when his Cessna 441 "suddenly plummeted" and crashed during clear weather. The National Transportation Safety Board's (NTSB) accident investigation found more than ten times the maximum dose of chlorpheniramine in his system. (Chlorpheniramine is often combined with phenylpropanolamine to form an allergy medication with both antihistamine and decongestant properties.) The pilot had taken ten times the normal dosage before the flight. The NTSB found that the pilot had no other health problems that contributed to the fatal crash.

After this accident, NTSB recommended FAA take the lead in getting important information out to the aviation community about pilots—commercial and general aviation alike—using medications, both prescription and over-the-counter medications, when they fly.

The FAA's Office of Aerospace Medicine has initiated a nationwide effort asking its aviation medical examiners and other aviation community leaders to inform pilots about the risks of taking any medication while flying. A new brochure, "Medications and Flying," is being distributed to pilots when they see their aviation medical examiner for physicals. This brochure is also available on the FAA Web site at: http://www.faa.gov/pilots/safety/pilotsafetybrochures/.

Calling All Mechanics

Keep Informed with FAA's Aviation Maintenance Alerts

Aviation Maintenance Alerts (Advisory Circular 43.16A) provide a communication channel to share information on aviation service experiences. Prepared monthly, they are based on information FAA receives from people who operate and maintain civil aeronautical products.

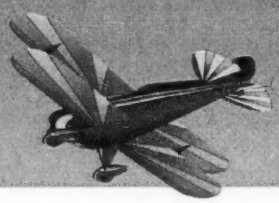
The alerts, which provide notice of conditions reported via a Malfunction or Defect Report or a Service Difficulty Report, help improve aeronautical product durability, reliability, and maintain safety.

Recent alerts cover:

- *control yoke corrosion issues for all Cessna 172/180/185 models*
- *cracked main gear actuators on the Cessna 172RG*
- *sheared rivets in the horizontal stabilizer pivot fittings on the Beech 400A.*

Check out Aviation Maintenance Alerts at: http://www.faa.gov/aircraft/safety/alerts/aviation_maintenance/

JAMES WILLIAMS



AV News

GA Fatalities Drop Dramatically in 2007

Nearly 90 percent of annual aviation fatalities occur in general aviation, according to the National Transportation Safety Board (NTSB). In 2007, according to recently released NTSB safety data, 491 people perished in general aviation accidents, a steep drop from the 703 general aviation fatalities in 2006.

	2006	2007
GA	703	491
Airlines	50	1
Air Taxi	16	43
Commuter	2	0
Foreign/Unregistered	13	10
Total	784	545

"This is encouraging news," said National FAA Safety Team (FAASTeam) Manager Kevin Clover. "It shows that the safety training, awareness, and outreach efforts around the community are paying off."

To view the complete release and the numbers in detail, visit: http://www.ntsb.gov/Pressrel/2008/081016a.html.

121.5 ELT Coverage to End

In case you haven't heard, COSPAS-SARSAT, the organization charged with providing satellites to search for emergency locator transmitter (ELT) signals, will cease monitoring the 121.5 MHz frequency on February 1, 2009. After that date satellites will only monitor the 406 MHz frequency. This means that most of the ELTs in GA aircraft will no longer be covered by the COSPAS-SARSAT network.

The 121.5 ELTs will still be investigated if a signal is detected by an overflying aircraft or a nearby airport. FAA is not planning to mandate a switch to 406 MHz ELTs but other countries are requiring the new ELTs. Check with the appropriate national governing agency if you plan to fly internationally.

More information can be found at http://www.sarsat.noaa.gov/. Also, see an article in the January/February 2008 issue of *FAA Aviation News* on the subject, available online at http://www.faa.gov/news/aviation_news/2008/media/JanFeb2008.pdf.

FAA Launches Lessons Learned Library

Recently, FAA launched a new online accidents lessons learned library. The Web site highlights significant accidents and shows what we can learn from them. At launch, 11 accidents are in the library (including Air Florida 90, ValuJet 592, and USAir 427). The goal is to have 40 accidents included by the end of 2009.

While these accidents currently cover only transport airplanes, many of the principles involved, such as decisionmaking, weather, fuel exhaustion, midairs, and ground incursions are equally applicable to GA operations. The Web site can be found at: http://accidents-ll.faa.gov/.

Federal Aviation Administration
ValuJet Airlines Flight 592, McDonnell Douglas Model DC-9-32, N904VJ
Location: Everglades, Near Miami Florida
Date: May 11, 1996

More WAAS Approaches than ILS

In the September 25, 2008, Terminal Procedures Publication (TPP) the FAA published a record 171 new localizer performance with vertical guidance (LPV) minima lines on the RNAV (GPS)

instrument approach procedures. These lines of minima are only available to aircraft equipped with the Wide Area Augmentation System (WAAS). This TPP cycle brings the WAAS/LPV procedure count up to 1,333, exceeding the 1,229 Category I instrument landing system (ILS) procedures. LPV is flown similar to a Category I ILS and has similar decision altitudes.

The FAA plans to publish 500 WAAS instrument procedures in 2009 and continue to publish WAAS procedures for each qualifying runway end. For more information on WAAS and airports with WAAS procedures, visit the GPS Web page at http://gps.faa.gov/.

New Aviation Safety Leadership

In October 2008, FAA Associate Administrator for Aviation Safety Nick Sabatini announced his retirement effective January 3, 2009. Sabatini became associate administrator in 2001. His safety leadership has been distinguished by a cooperative approach to work across the aviation community to address key safety issues.

Under Sabatini, FAA moved to enhance aviation safety by gathering, analyzing, and sharing data to tackle the leading causes of accidents and to take targeted interventions to reduce risk. Sabatini has also been a prominent spokesperson in the work being done to move to a performance-based National Airspace System.

Margaret "Peggy" Gilligan, who has served as Deputy Associate Administrator for Aviation Safety since 1995, succeeds Sabatini as Associate Administrator. Gilligan joined FAA in 1980 and served four administrators as chief of staff. She also served in the Chief Counsel's office in Washington and as a staff attorney in FAA's Eastern Region.

Flight Standards Leadership Changes

Effective in January 2009, Flight Standards Service Director Jim Ballough is serving as an advisor to the Associate Administrator for Aviation Safety. Ballough joined FAA in 1986 as an airworthiness inspector in Pittsburgh, Pennsylvania, and worked his way up to serve as Principal Maintenance Inspector on the US Airways certificate and then as Assistant Manager, Flight Standards Division, Eastern Region. He was named Director, Flight Standards Service in 2001.

Ballough has been recognized by *Aviation Week & Space Technology Magazine* with its Laurel Award for his leadership in the implementation of Reduced Vertical Separation Minima. The Air Transport Association presented him with the Nuts and Bolts Award, which recognizes exemplary leadership and goes to individuals who have gone the extra mile to improve processes related to airline engineering, maintenance, or materiel management.

Ballough's successor as Flight Standards Service Director, John Allen, served as Deputy Director, Flight Standards Service since 2003. In his 17-year tenure in Flight Standards, Allen has led efforts to implement an integrated systems approach to safety management and has provided leadership in the move to a performance-based aviation system that puts more operational capability directly into the aircraft.

Allen is a Brigadier General in the U.S. Air Force Reserve and has served as an Airlift Squadron Commander, Vice Wing Commander, and Pentagon Staff Officer. He began his Air Force service as an Air Force Reserve Instructor Pilot. He is an ATP with more than 4,700 hours. Allen is a graduate of the University of Florida with a B.S. in business administration. He received an M.S. in aeronautical technology from Arizona State University.

Peggy Gilligan

Look for FAA at Women in Aviation

Associate Administrator for Aviation Safety Peggy Gilligan will give a presentation on "The Importance of Data Sharing to Improve Safety" at the 20th Annual Women in Aviation, International (WAI) conference to be held February 26 through 28 in Atlanta, Georgia. Gilligan is just one of many FAA women executives who will participate in the WAI conference, which supports networking, education, mentoring, and scholarship opportunities for women (and men) who are striving for challenging and fulfilling careers in the aviation and aerospace industries.

Gilligan, along with seven other FAA executives, will also be on hand at a "Friendly Fire Town Hall" to answer questions about FAA policy on safety, airports, the environment, as well as international aviation issues. Also, FAA's Aviation and Space Education (AVSED) Team will conduct aerospace education workshops on how to motivate students and to help teachers use simple aviation activities to engage our future workforce in science, mathematics, engineering, and technology.

Among other FAA-related activities at the conference, the FAA Safety Team (FAASTeam) will have a booth featuring safety information for pilots and mechanics. FAASTeam members will be on hand to demonstrate the faasafety.gov Web site as well as answer questions about safety programs. In addition, FAA will host another booth with information on FAA employment.

Clear Skies, Clear Head?

JAMES WILLIAMS

Pilots are too smart to go flying while under the influence of drugs or alcohol. Right? Most of us would certainly like to think so, but the numbers tell a different story. Pilot impairment from drugs or alcohol is a factor in one out of every 25 fatal GA accidents. A review of National Transportation Safety Board (NTSB) records from 1995 to 2004 shows 224 accidents involving pilot impairment of some kind. Although this number constitutes only 1.2 percent of aircraft accidents, the 332 fatalities from these accidents account for 5.4 percent of total GA deaths for that period. When you consider how completely preventable these deaths could have been, they are painfully large numbers.

Both prescription and non-prescription drugs can have debilitating side effects for pilots.

What Were They Taking?

Alcohol is a dominant factor in fatal roadway accidents. Nearly 40 percent of driving fatalities in 2005 were alcohol related. The influence of alcohol in fatal GA accidents is much harder to determine. According to a report from FAA's Civil Aerospace Medical Institute (CAMI) the body's normal post-mortem production of ethanol makes it difficult to establish whether the pilot was drinking prior to the accident. Drug impairment, however, is not in question. In the pilot-impairment accidents that occurred between 1995 and 2004, for example, the main culprits are as follows:

- Prescription drugs (64 accidents, 99 fatalities, 5 serious injuries)
- Alcohol (61 accidents, 61 fatalities, 14 serious injuries)
- Non-prescription drugs (49 accidents, 91 fatalities, 8 serious injuries)
- Illicit amphetamines (26 accidents, 45 fatalities, 4 serious injuries)
- Marijuana (24 accidents, 36 fatalities, 2 serious injuries)

Though the classification above lists only the main impairing agent, note that in many accidents there was evidence of more than one drug.

Isn't That a Safe Drug?

The aviation medical establishment has long stressed the fact that both prescription and non-prescription drugs can have debilitating side effects for pilots. One of the most frequently detected non-prescription drugs is diphenhydramine, a common antihistamine in most cases known as Benadryl®. Diphenhydramine has been detected in 131 accidents, which accounted for 126 fatalities and 18 serious injuries. Though we are not suggesting that this substance was a causal factor in all of these accidents, it is nevertheless significant that it has been associated with many. It is less surprising when you consider that the side effects of diphenhydramine include drowsiness, reduced mental alertness, impaired coordination, and blurred vision. These side effects could easily lead to accidents and potentially fatal consequences.

The side effects of more powerful prescription drugs, like codeine, are even more disabling. Codeine is a pain killer and cough suppressant derived from opium. Some of its side effects include dizziness, constipation, mental confusion, and nausea. Quite apart from the side effects, consider this point: Should a pilot whose discomfort is significant enough to require codeine be flying at all?

What about Anti-Depressants?

The use of anti-depressant drugs is prohibited for pilots. A further review of NTSB accident

records revealed 102 accidents where some kind of anti-depressant was detected in a crew member. These accidents resulted in 165 fatalities and 12 serious injuries. While the presence of anti-depressants was not the direct cause of many of these accidents, these drugs do have side effects than can limit the pilot's ability to react. According to Medline, a service provided by the U.S. National Library of Medicine and the National Institutes of Health, the side effects of Paroxetine (aka Paxil), which was detected in many of these accidents, include headache, dizziness, weakness, difficulty concentrating, nervousness, forgetfulness, confusion, sleepiness or feeling "drugged," nausea, vomiting, diarrhea, and more. Another commonly detected anti-depressant was Citalopram (aka Celexa). Its side effects include nausea, diarrhea, vomiting, stomach pain, drowsiness, excessive tiredness, uncontrollable shaking of the body, excitement, nervousness, and more.

It's Up To You

In almost every case, the pilot had not reported use of these drugs, often prescribed by a personal physician, to the aviation medical examiner (AME). This disconnect between a personal physician and an AME can be the source of problems. The personal physician may not be aware that the patient is a pilot. Even if this fact is known, the personal physician may not realize that many pharmaceuticals are disqualifying for pilots because of their effect at higher altitudes. It is essential to check with an AME when taking any medication that could possibly affect your fitness to fly. The key point to remember is that aviation is far less tolerant of impairment than driving. Flying requires a higher level of coordination, concentration, and mental computation than driving, so any deterioration of those abilities can take a greater toll.

As a community, we need to be responsible and accountable. Don't drink before you fly. Check the side effects of any medication you are taking, and don't hesitate to check with your AME or the FAA's Aerospace Medicine Division if you have any questions. Contact information for the Aerospace Medicine Division is available at: http://www.faa.gov/pilots/medical/. The bottom line is clear: If you are taking a medication that would prevent you from getting a medical, you should not fly. Be sensible, and be safe!

What the Rules Say

The regulations are clear on prohibiting flight while impaired. Title14 Code of Federal Regulations section 61.53, Prohibition on operations during medical deficiency states:

> (a) Operations that require a medical certificate. Except as provided for in paragraph (b) of this section, a person who holds a current medical certificate issued under part 67 of this chapter shall not act as pilot in command, or in any other capacity as a required pilot flight crewmember, while that person:
>
> (1) Knows or has reason to know of any medical condition that would make the person unable to meet the requirements for the medical certificate necessary for the pilot operation; or
>
> (2) Is taking medication or receiving other treatment for a medical condition that results in the person being unable to meet the requirements for the medical certificate necessary for the pilot operation.

The full regulation is available at: http://ecfr.gpoaccess.gov/, under Title 14, Part 61, Subpart A, Section 61.53.

For More Information

Postmortem Ethanol Testing Procedures Available to Accident Investigators (DOT/FAA/AM-07/22)
http://www.faa.gov/library/reports/medical/oamtechreports/2000s/media/200722.pdf

FAA's Forensic Toxicology's WebDrugs
http://jag.cami.jccbi.gov/toxicology/default.asp

National Institutes of Health's MedlinePlus Drugs, Supplements, and Herbal Information
http://www.nlm.nih.gov/medlineplus/druginformation.html

James Williams is a technical writer-editor in FAA's General Aviation and Commercial Division. He is also a pilot and ground instructor.

Stress in Flight

Keeping your cool in the cockpit

GREG GORAK

Although we tend to associate stress with such obvious stress generators as check rides or emergency situations, the reality is that pilots inevitably encounter stress in the simple everyday pursuit of their aviation interests. As you may know or recall from your own experience, just the act of talking to ATC on the radio can rattle your composure and create stress. And, stress is bad...right?

What Is Stress?

The Pilot's Handbook of Aeronautical Knowledge (FAA-H-8083-25) states that a certain amount of stress is good, "since it keeps a person alert and prevents complacency." Also, because stress is the body's response to physical and psychological demands, everyone is stressed to some degree almost all the time.

Yet, there is no question that stress can be detrimental to optimal performance. Think for a moment about how any of the following conditions have affected you: check rides, events perceived as "check rides" (flight review or instrument proficiency check), tight time schedules, deteriorating weather conditions, fatigue, "get-home-itis," congestion, and equipment malfunctions. If you fly a glass-cockpit aircraft, you have probably also experienced what you could call "systems management stress," which can occur at those times when we can't seem to remember what knobs or buttons produce the correct results. How did you react?

Although everyone perceives and reacts to stress differently, the body typically reacts in certain predictable ways. For example, when the body perceives stress, it attempts to adjust its defenses in the same way it would attempt to ward off a physical attack. The body's reaction to stress includes releasing chemical hormones (such as adrenaline) into the blood and increasing metabolism to provide more energy to the muscles. Blood sugar, heart rate, respiration, blood pressure, and perspiration all increase. The visible results of these involuntary physical reactions can include a noticeable tensing of the muscles, dilation of the eye pupils, constriction of skin vessels, deeper breathing, heart pounding, and pressure on the bladder.

Acute or Chronic?

Stress can arise from a number of factors called "stressors." Common stressors in aviation can include physical stress (noise or vibration), physiological stress (fatigue), and psychological stress (pressure to perform for passengers).

Stress falls into two broad categories. Acute stress is a short-term phenomenon that triggers the "fight or flight" reaction. It usually arises from an immediate threat that is perceived as danger. On-going acute stress can develop into chronic stress, which has cumulative adverse effects and can exceed the individual's ability to cope. Whether it is acute or chronic, stress can negatively impact the pilot's ability to make effective decisions during flight and thereby increase the risk of pilot error.

Reducing Stress

How can the stress of a particular situation be minimized, or at least reduced to acceptable lev-

els? Techniques to help manage the accumulation of stress and prevent overload before and during your flight include:

- Include relaxation time in a busy schedule
- Maintain a program of physical fitness
- Learn to manage time more effectively
- Take a self-assessment to help set realistic goals
- Avoid stressful situations and encounters
- Always review your plan, use a checklist, and cross-check your instruments

In aviation, an important part of stress management is to engage in comprehensive and recurrent training. Through regular training to proficiency, a pilot can reduce the level of aviation-related stress by boosting self-confidence. If, for example, you know (or suspect) that your instrument flying skills are rusty, training with a qualified instructor will make you a safer and less stressed pilot. This training should include intelligent use of a flight training device, which provides the opportunity to safely practice—and polish—techniques that could be more costly (or, in some cases, more risky) in actual flight.

If we accept the premise that confidence stemming from comprehensive recurrent training minimizes stress, then it follows that the flight instructor must be a prime participant in this process. A capable instructor who empathizes with the student's needs, abilities, and responses, including physiological stress reactions, can minimize a student's fear of failure and thus the stress he or she encounters, by:

- Identifying mistakes that are common to most students so the student doesn't feel unique in making those mistakes.
- Setting mini-goals, such as separating complex operations into component parts and allowing the student to master each segment before moving to the next the element.
- Using scenario-based component training, to make the individual segments more realistic and appropriate to the real world of flying.
- Communicating to the student that the instructor is confident of his or her abilities.

We cannot eliminate stress. But we can reduce its negative effect on our judgment and performance by recognizing its symptoms and always working for proficiency.

For More Information

Pilot's Handbook of Aeronautical Knowledge (FAA-H-8083-25) p. 15-6
http://www.faa.gov/library/manuals/aviation/media/FAA-H-8083-25A.pdf

Online Video – Self-imposed Stress and Aviation
http://www.faa.gov/safety/programs_initiatives/health/media/SelfImpStress.wmv

The Relationship between Aviators' Home-Based Stress to Work Stress and Self-Perceived Performance
http://www.hf.faa.gov/docs/508/docs/cami/00_32.pdf

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Personal Minimums
How Old Is Too Old?

JIM TRUSTY

Age and age-related health issues are tough topics for most pilots. Up to a point, we can mostly (even if reluctantly) accept that a few more wrinkles bespeak a lot more experience and confidence in the cockpit. But, just as there are limits on how much lift a wing can develop before it reaches the critical angle of attack, there are also limits on how long a pilot can perform before experiencing indicators of age-related "stall buffet."

Be honest: When you have mental lapses while in pursuit of your aviation dreams, do you quickly think of an excuse to get you off the hook? Have you known you might be slipping a little and just refused to accept that some of your senses might be slowing down? It's a tough truth to take.

Physiological "Stall Buffet"

Even tougher is the question of what to do about it. Unlike a wing, which stalls abruptly when the critical angle of attack is exceeded, the aging human body often "stalls" in a more subtle and more gradual way. The exam we periodically get from the aviation medical examiner (AME) is primarily a snapshot. Except for some sudden disqualifying medical event, such as a heart attack, few pilots go from "medically sound and safe" to "unfit and unsafe" overnight. So, how do we know how long is too long?

For those who are reasonably honest and self-aware, there are certainly indicators along the way. Almost every day, I meet pilots who have already stopped trying to stay current, stopped renewing their certificated flight instructor (CFI) certificates, stopped practicing, or even stopped getting medical certificates renewed. Some know, at least at some level, that they have begun to have trouble in flying, navigation, take-offs and landings, or maybe radio communications. But they still want to be pilots, pilots who fly enough to maintain their airport "hangar rat" credentials.

Recognize and Recover

From the earliest stages of training, pilots learn to recognize and correctly recover from the first indications of an aerodynamic stall. As we grow older, being pilot in command demands that we also learn to recognize and deal with the indications of a "physiological stall." Just as we rely on instructors to help us learn about aerodynamic stalls, sometimes it takes another set of eyes, such as a trusted co-pilot or a qualified instructor, to help us recognize the physiological signs we'd rather not acknowledge on our own. I sometimes hear pilots who are friends or clients relating stories of things that happened or mistakes they made on their last flight. It's scary.

I consider it part of my responsibility, both as a friend and a flight instructor, to provide honest feedback. When, for example, you sense that you are slowing down, it goes without saying that you need to work as hard as you can at staying healthy through diet, exercise, and regular check-up visits with your physician. Another recognize-and-recover step you can take is to do things more slowly. You could step back to a slower airplane, reduce the number of long and tiring trips you take in the airplane, and consider flying only in daylight.

There are also cases where honest feedback means that it's time to consider alternatives to flying solo. These alternatives need not be painful. In fact, I'll bet that most of us find flying to be more fun anyway when it's shared with our aviation friends. I'm also willing to bet that you can find an older flight instructor at your airport who would just love to go flying with you on a regular basis (and possibly at a reduced rate). I know this is true at my airport, because I gladly do it almost daily.

Most of all, be honest with yourself and do whatever it takes to avoid having an accident or an incident at any age.

For More Information

Just for the Health of Pilots
http://www.faa.gov/library/reports/medical/hop/

Longevity: Living Longer and Enjoying Good Health
http://www.faa.gov/library/reports/medical/hop/media/longevity.pdf

Pilot Age and Performance: An Annotated Bibliography (1990-1999)
http://www.faa.gov/library/reports/medical/age60/media/age60_1.pdf

Pilot Age and Accident Rates Report 4: An Analysis of Professional ATP and Commercial Pilot Accident Rates by Age
http://www.faa.gov/library/reports/medical/age60/media/age60_4.pdf

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SUSAN PARSON

Checklist

Things that go bump in the flight

For More Information

FAA Wildlife Strike Database
http://wildlife.pr.erau.edu/FAADatabase.htm

FAA Form 5200-7 Bird/Other Wildlife Strike Report Form
http://wildlife.pr.erau.edu/EnglishManual/2005_FAA_Manual_app_i.pdf

Best Practices: Wildlife Management
http://www.faa.gov/airports_air-traffic/airports/regional_guidance/central/airport_safety/part139/best_practice/wildlife/

Airport Wildlife Hazard Mitigation Home Page
http://wildlife-mitigation.tc faa.gov/public_html/index.html

FAA Annual Report: "Wildlife Strikes to Civil Aircraft in the United States 1990-2007"
http://wildlife.pr.erau.edu/BASH90-07.pdf

A recent check of my e-mail inbox brought one of those Yogi Berra "déjà vu all over again" moments: The subject line read "Deer strike—aircraft grounded." Two years ago, the bent metal belonged to my flying club's Cessna 182, which spent the next six months in a hangar to have nearly $35,000 in damage to the empennage and aft fuselage repaired. More recently, the grounded aircraft belonged to the Civil Air Patrol. Damage was minimal this time and, as is the case for many close encounters between aircraft and wildlife, there were no human injuries. Clearly, though, deer aren't good for the health of pilots or aircraft.

They're Everywhere...

With an estimated U.S. deer population of more than 26 million, it is no wonder that collisions between aircraft and deer are so common. Deer have adapted to human environments, including airports, with predictable results. From 1990 to 2007, more than 760 deer-aircraft collisions were reported to the FAA. Of these, at least 629 indicated the aircraft was damaged in connection with the collision. (Not all damage results from actually hitting the animal; in some cases, the pilot's evasive action attempts have caused the need for repairs.)

Is Avoidance Possible?

Deer are most active in the twilight hours and at night when they feed. So it is not surprising that most airplane/deer strikes occur during this period of reduced visibility. The longer hours of darkness in autumn and winter are prime times for these collisions. A study by Northwestern University's McCormick School of Engineering and Applied Science provides insight into the "modes" in which an animal such as a deer or a bird could find itself in relation to another object, such as your airplane. The "deliberative" mode most often occurs during daylight, which provides the ability to see and deliberately avoid moving objects. With less visibility, however, the operative modes are "reactive" or, at worst, "collision." (For more on this study, see http://www.sciencedaily.com/releases/2007/11/071120095410.htm).

What Can You Do?

As any pilot (or automobile driver) who has experienced a deer or bird strike can attest, the operative modes—for both humans and critters—during the reduced visibility of twilight and evening hours are the "reactive" and "collision" modes. The typical advice with respect to birds (at least those you can see) is to climb, since the bird's instinctive reaction is to dive for greater airspeed. In the case of deer, however, there is probably little that you as the pilot can do to avoid collision if a deer decides to make a runway incursion while your airplane is using the asphalt for taxi, takeoff, or landing. But if you hear or feel something go bump in the flight, the most important thing you can do is, as always, fly the airplane. Avoid the temptation to take evasive action that could lead to loss of control. Evasive action attempts can be more damaging—and sometimes more deadly—than impact at relatively low speed.

Though not a preventive action, you can also help by reporting wildlife strikes, including both bird and deer strikes, to the FAA. Reporting collisions with wildlife is crucial to helping the agency use its wildlife strike database for a greater understanding of the problem. You can find FAA Form 5200-7 online, as the FAA now provides electronic filing for wildlife strike reports. In addition, the FAA maintains an Airport Wildlife Hazard Mitigation Home Page, which serves as a good resource for information regarding wildlife aircraft hazards.

Susan Parson is a special assistant in Flight Standards Service's General Aviation and Commercial Division. She is an active general aviation pilot and flight instructor.

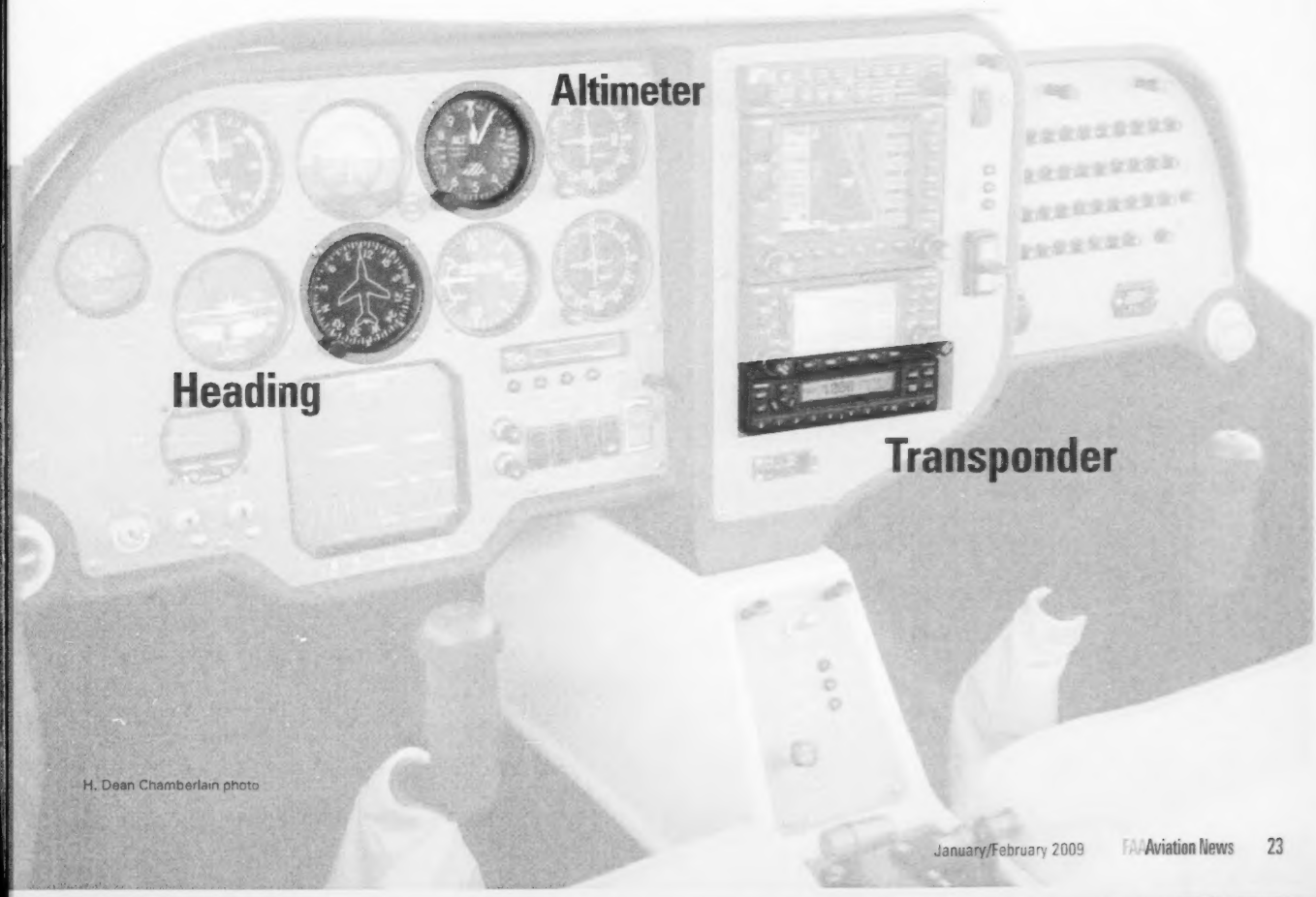
"HAT Check"

Heading Off Dangerous Distractions

DOUG STEWART

Editor's Note: Human factors and aeromedical research studies show that human beings at all ages are vulnerable to distractions and memory lapses. Aviation abounds with acronyms and mnemonics designed to fight such fallibilities—what pilot hasn't heard of the CIGARS run-up checklist? In this article, Master Flight Instructor Doug Stewart offers "HAT check" as a way to remember several key pre-takeoff tasks.

The account of the accident of Comair Flight 5191 and opinions about the accident are those of the author.

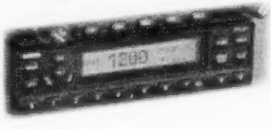


H. Dean Chamberlain photo

In the wee hours of the morning of August 27, 2006, a CRJ-100 was cleared by the tower of the Lexington, Kentucky, Blue Grass Airport to take off on runway 22, a 7,300-foot long runway. As most of us know, the crew mistakenly taxied onto runway 26, which is only 3,500 feet long, and attempted to take off. The airplane ran off the end of the runway, hit the airport perimeter fence and trees, and crashed. All but one of the persons aboard died and the airplane was destroyed by impact forces and the post-crash fire. (The first officer was the only one to survive. He lost a leg and suffered brain injuries.)

I know that many of us in the general aviation world were asking the question: "How could they have done that? Didn't they check the compass and horizontal situation indicator (HSI) with the runway heading?" Obviously they didn't, and I'll address that in just a little bit.

The cockpit voice recorder transcripts released by the National Transportation Safety Board (NTSB) show that the pilot and co-pilot talked about their kids and dogs as they taxied to line up on the runway. The chatter was in violation of an FAA regulation that bans "nonessential cockpit conversation" during taxi, takeoff, and landing. These were professional pilots, flying under Title 14 Code of Federal Regulations (14 CFR) part 121, which strictly regulates things like "sterile cockpits" and other essential items of effective crew/cockpit resource management (CRM).



But what about all of us who do not have to fly under that type of regulation? Is there anything that we can take from this accident that might prevent a similar catastrophe? Absolutely, there is a lesson to be learned even if we are flying a single-seat airplane that was built in the 1930s and we are operating out of a sleepy grass airstrip.

Clearly, the biggest mistake the CRJ pilots made was to take off on the wrong runway. Early in my flight instructing career, I came up with an acronym to help keep me as well as my clients from making that same mistake (along with a couple of others). The acronym is HAT check and stands for heading, altimeter, and transponder.

As I line up for takeoff on the runway, the first thing I do is to take care of the "H" (for heading) of the HAT check to ensure that the runway heading, my compass, and my directional gyro are all in agreement. If any one of the three is in disagreement, then there is definitely a problem that needs to be resolved prior to applying takeoff power. Failure to do so might gain you an appellation similar to one gained by a certain Mr. Corrigan numerous years ago.

I know I am not the only pilot who has announced, as I back-taxied on the runway of a small non-towered airport: "Boondocks traffic, Super Cruiser back-taxiing runway 29," as I eagerly set my directional gyro (DG) to 290 degrees to minimize my time prior to takeoff. Of course, the only problem was that I was heading 110 degrees as I did all of this.

The only thing that saved me that late afternoon as I took up an easterly heading after departure (according to my DG) was that the sun was shining directly in my eyes. Something was obviously wrong. In this somewhat humorous (and embarrassing) anecdote, the only thing injured was my ego.

But, when operating at a busy airport with multiple runways, and kick up the ante even more by adding nighttime to the mix, there is no doubt that ensuring that your DG (or HSI), your compass, and the runway heading are all in agreement, will lead to greater longevity.

The next letter in the HAT check acronym, "A" for altimeter, is not as critical as the "H" if operating in daytime Visual Meteorological Conditions (VMC). Yet, it could lead to an early demise if it is dark out or there are clouds obscuring your vision outside the airplane. Again, I know I am not the only pilot who has mistakenly set my altimeter with an error of 1,000 feet. Now, if you have set your altimeter 1,000 feet too low, the possibility of coming to a screeching halt on the downwind is nowhere near as great as when you do the opposite and set it 1,000 feet too high.

Recently, I was working with a client in my PA-12. As we approached the airport and were descending to pattern altitude I noticed that the houses appeared to be getting much bigger than they usually do. Questioning my client as to proper pattern altitude I got the correct answer, but when I asked how much further we might be descending, I was a bit dismayed to hear "another 800 feet." (Indeed, the altimeter showed another 800 feet to descend to pattern altitude.) I suggested we ignore the altimeter for the time being and fly "out the window," and we would check the altimeter once we were ground bound. When we did that, the altimeter indicated we were 1,000 feet above the ground. Obviously, if this incident had occurred at night or in low instrument meteorological conditions (IMC), I would most likely not be writing this article.

The last letter in the HAT check acronym is "T" for transponder set to altitude. I know that many of our vintage aircraft might not even have a transponder and some who have one don't like to use it. However, I make a point of turning mine on if for no other reason than the fact that it might give a heads up of my presence to one of the many pilots zooming around in their glass-paneled aircraft, who hardly ever look outside the cockpit. With their Traffic Information Service (TIS) systems at work displaying all the transponder replies on one of their big glass screens, hopefully my blip will appear there. Even if they don't see me out the window as they fly by, they may be aware of my company and avoid me.

Another reason for ensuring the transponder has been set to altitude prior to takeoff when departing into Class C or B airspace is to avoid having departure control ask you to "recycle your transponder." (This is their nice way of saying: "Turn it on, dummy.")

Had the pilots of Comair flight 5191 checked their HATs at the door there might not have been an accident that day. Another thing that contributed to the accident chain was the fact that the pilots did not maintain a "sterile cockpit." Under 14 CFR part 121 they are mandated to do this, but pilots operating under part 91 are not. However, we should all take note that if a "sterile cockpit" works in an airline cockpit, we would be well advised to adopt a similar policy in the cockpits of the aircraft we fly. For techniques and procedures to enhance taxi, pre-takeoff, as well as after-landing safety to reduce the risk of runway incursions, see Safety Alert for Operators (SAFO) 08001 at http://www.faa.gov/other_visit/aviation_industry/airline_operators/airline_safety/safo/all_safos/media/2008/SAFO08001.pdf.

If we all were to embrace the concept of limiting our cockpit conversations with our passengers to only those things "essential" to the safety of flight whenever we are operating in the air or on the ground, safety would be improved exponentially. We just can't be as effective as we need to be in all the sundry things that require our attention prior to takeoff and during the climb-out when we are engaged in conversations about the wife and kids, yesterday's ball game, or the latest joke. Please brief your passengers on the "sterile cockpit" concept. If we want to remain "pliant," we need to be silent.

Always do a HAT check. Set heading, altimeter, and transponder before departure.

The accident in Lexington was a tragedy made more so by the fact that it was so preventable. Hopefully, we can take the lessons learned from analyzing the mistakes those pilots made and apply them to our own flying. Remember how important it is to ensure that you are departing on the correct runway. Run a HAT check (or its equivalent) prior to takeoff. Maintain a "sterile cockpit" whenever you are in an airport environment. Doing these things will help ensure that you experience many more days of blue skies and tailwinds.

Doug Stewart is the 2004 National CFI of the Year, a Master CFI and a DPE. He operates DSFI, Inc (www.dsflight.com) based at the Columbia County Airport (1B1) in Hudson, New York.

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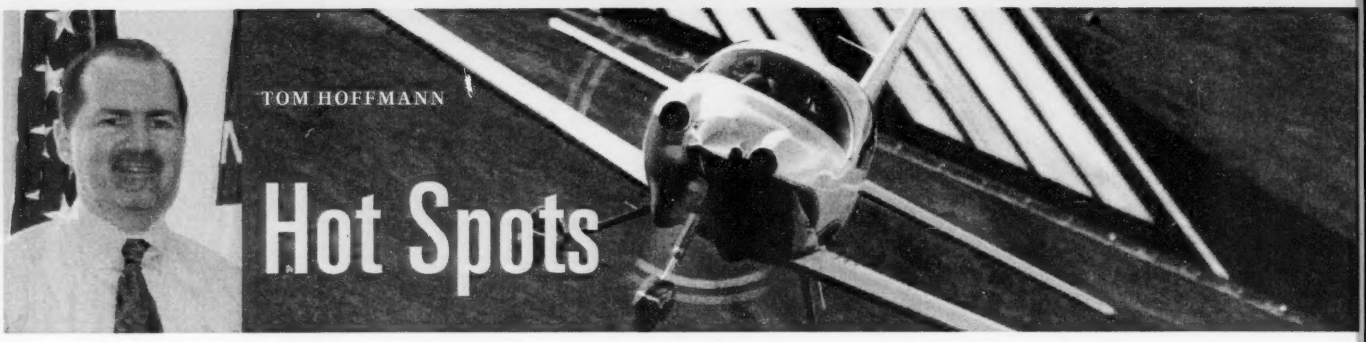


TOM HOFFMANN

Hot Spots

Project Runway: Avoiding the Hottest 'Hot Spots'

It just doesn't seem to be that difficult.

You've completed a challenging flight, maybe one that involves some bad weather. The approach was a success. The landing was among your best. But those visions of a perfect flight went up in smoke when you blundered into a runway "hot spot," which is what the FAA's Office of Runway Safety calls those areas that carry an increased risk of runway incursions. These high-alert areas may include the intersection of two runways, the intersection of a runway and a taxiway, or a runway feature (such as a gradient or the likelihood of sun glare) that makes it difficult to see other aircraft.

A runway incursion is "Any occurrence at an aerodrome involving the incorrect presence of an aircraft, vehicle, or person on the protected area of a surface designated for the landing and takeoff of aircraft."

Exploring Real "Hot Spots"

These conditions exist not only at large-scale multi-runway airports, but also at smaller single-runway landing fields. Take, for example, the airport configuration at Colonel James Jabara Airport (AAO), near Wichita, Kansas. At first glance, the runway configuration may appear straightforward—how can you get disoriented with only one runway? However, the differential between the runway gradient and the approach end elevation at Runway 18/36 can cause pilots to lose line of sight of aircraft on opposite ends of the runway (see Figure 1).

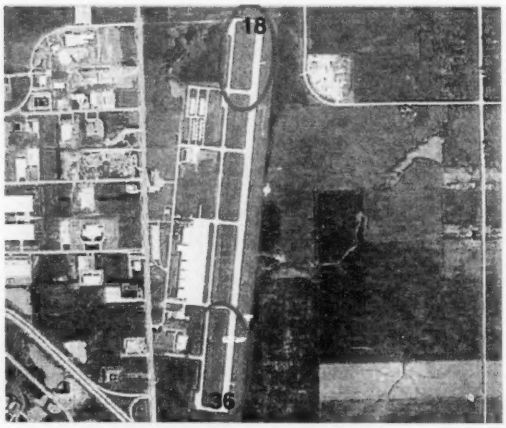


Figure 1: Colonel James Jabara Airport (AAO)

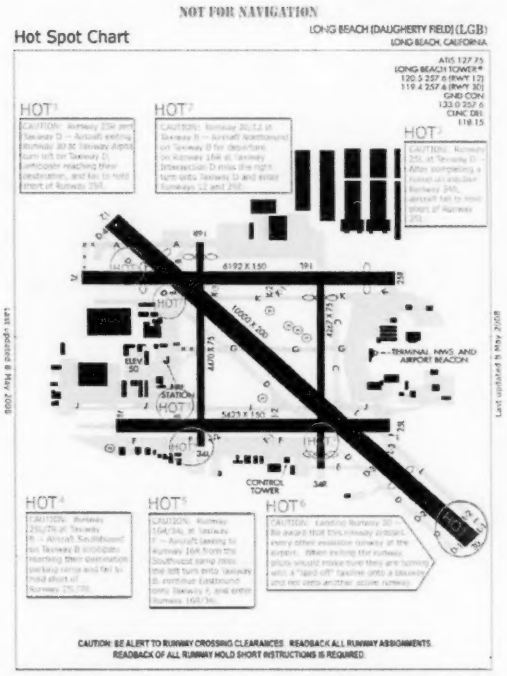


Figure 2: Airport Diagram for Long Beach Daugherty Field (LGB)

Another airport that presents challenges for surface operations is Long Beach Daugherty Field (LGB). There are six identified hot spots at LGB where pilots can get disoriented at night or with low visibility (see Figure 2). One of these cautions pilots about exit procedures for Runway 30, which intersects every other runway—yes, every other runway at the airport. If you operate to this field, make sure you are turning with a "lead-off" taxi line onto a taxiway, and not onto another runway.

Don't Get Burned

Here are some self-briefing questions that will help you avoid being scalded by contact with a runway hot spot:

- What taxiways will I be using?
- Will I be crossing any runways?
- Are there any tricky intersections I should know about?
- Are there any known areas of confusion I should know about?
- Could weather or low lighting be a factor in maintaining awareness of my location?

To answer these questions, use all available tools to plan your taxi route. These include Automated Terminal Information Service (ATIS), *Notices to Airmen* (NOTAMs), and airport diagrams. Some regional FAA Runway Safety Offices offer downloadable brochures that identify hot spots at airports in the region. You can also benefit from the experience of other pilots and flight instructors.

If you become disoriented or unsure of your position while taxiing, make sure you are clear of any runway and stop the aircraft. Then, advise ATC and, if necessary, request progressive taxi instructions. Don't be afraid to ask for help. It might just save your life!

Top 10 Best Practices for Airfield Safety

1. Use correct terminology and proper voice cadence.
2. Eliminate distractions in the operational area.
3. Use airport diagrams. (www.faa.gov/runwaysafety)
4. Conduct "clearing turns" prior to entering ANY runway.
5. Maintain a sterile cockpit when taxiing.
6. Maintain appropriate taxi speed.
7. Attend safety seminars and programs on runway safety.
8. Improve safety by teaching, advocating, stressing, and understanding situational awareness.
9. Realize that every airport is unique and presents its own set of runway safety challenges.
10. Stay alert; stay alive.

Tom Hoffmann is Associate Editor of FAA Aviation News. *He is a commercial pilot and holds an Airframe and Powerplant mechanic certificate.*

Pre-Taxi Planning

The FAA Web site features an online directory of National Aeronautical Charting Office (NACO) airport diagrams located at http://www.faa.gov/runwaysafety/naco.cfm. These helpful diagrams can be searched by airport identifier, name, or state. In addition, the FAA provides an online digital *Airport Facility Directory* (A/FD). Just go to http://www.naco.faa.gov/ and click Free Downloads, then click digital A/FD.

These are both great tools to help pilots become more familiar with an airport's layout and performing proper pre-taxi planning. Take the time to identify complex intersections and potential runway crossings. The proper planning and understanding of your taxi route can never be underestimated.

Now playing at a DVD player near you...

The new "Runway Safety Collection" DVD produced by the FAA's Office of Runway Safety is a four-part series of videos that explores risk and prevention strategies while operating in the terminal airspace and on the surface of airports. It is an educational tool designed to help avoid runway incursions. To get a copy of the DVD, just contact your local FAAST Team Program Manager, or go to www.faasafety.gov and click the Videos on Demand banner on the home page.

BUILD A *Plane*

Lindy and Allison Whitlesy are two thumbs-up over the recent restoration of this classic Cessna.

High school students learn fabric recovering thanks to the Thomas Wathen Foundation at historic Flabob Airport in Riverside, California.

Teaching More than Aviation

JODI ANN CODY

For a few lucky high school students around the country, a program called Build A Plane means that learning about science, math, and engineering is a lot more exciting. An Internal Revenue Service (IRS)-approved 501 (c)(3) program that works in partnership with the FAA's Aviation and Space Education (AVSED) Program, Build A Plane promotes aviation education by soliciting aircraft donations and then providing the aircraft at no cost to high schools around the country.

By letting students work on real airplanes, Build A Plane projects give students real-world inspiration to learn more topics that, to many, seem abstract and irrelevant. "Kids are really excited to have a real airplane show up in their school," said Lyn Freeman, Build A Plane's founder. "It's almost like we trick them, because when they're finished working on the plane, they've actually learned math, science, technology, and engineering."

Making Magic

Even better, for many students the project triggers a lifelong love affair with aviation. "There's something exciting that happens when kids get a real airplane project," Freeman observed. "For example, we had a group of kids who were enrolled in a simple engine repair class. Their teacher arranged to have a Build A Plane aircraft donated. Now, the engine they were working on sat in the front of a Cessna 150."

By the end of that year, two students had taken flying lessons and soloed, two more had enrolled in a weekend A&P (airplane and powerplant) program at a local community college, and a fifth had enrolled at Embry Riddle Aeronautical University. "That's the kind of magic that can happen when you put kids and airplanes together," Freeman added.

Build A Plane is also contributing to aviation education by developing aviation curricula for schools where an aircraft construction project may not be appropriate. An example is the Real-World Design Challenge sponsored by the U.S. Department of Energy (DoE) and FAA.

"The DoE and a wonderful CAD (computer assisted design) software company, called PTC, were looking to offer an engineering and design challenge for high school kids," Freeman said. "Build A Plane entered the conversation and was able to have them consider the possibility of making the challenge focus on aviation." When Cessna Chief Executive Officer (CEO) Jack Pelton pledged the help of Cessna's top engineers to develop a program that encourages students to design "greener" aircraft, the path was set. FAA got onboard as well. As a result, PTC is donating millions of dollars worth of CAD software to high schools around the country for this aviation engineering challenge. The software also allows students to get online mentoring from scientists and engineers in FAA facilities, all 17 DoE labs across the country, and scientists from the Oakridge National Laboratory.

Can You Spare an Airplane?

The program began in 2003 and by the end of last year included more than 100 projects across the United States, with additional programs in India and Nigeria. Members of Build A Plane's advisory board include Pelton; Burt Rutan, president emeritus of Scaled Composites; Tom Poberezny, president of the Experimental Aircraft Association (EAA); Bruce Landsberg, executive director of the Aircraft Owners and Pilots Association/Air Safety Foundation (AOPA/ASF); Peter Bunce, CEO of General Aviation Manufacturers Association (GAMA); Ed Bolen, CEO of the National Business Aviation Association (NBAA); and many others. Still, Freeman says the biggest challenge is keeping up with demand for aircraft donations. Currently Build A Plane has a waiting list of more than 200 schools across the country.

"One of the most meaningful things people can do is to donate an aircraft, kit planes, certificated aircraft, you name it, we'll find a great home for it," Freeman said. Because Build A Plane is 501 (c)(3), donors get a receipt allowing them to make a tax deduction.

Yup'ik Eskimo students from Alaska's Hooper Bay High School build an airplane.

Build A Plane is growing in visibility and industry support. At EAA AirVenture® 2008 in Oshkosh, Wisconsin, GAMA gave the program a large presence in its display area. Students from Frankfort High School in Kentucky restored an Aeronca at the GAMA display before trailering the aircraft home for completion. Build A Plane also showed off a new airplane with a sign bragging that students would soon travel to Arlington, Washington, and build an entire Glasair *Sportsman* kit plane. The completed Glasair *Sportsman* is earmarked to become the Build A Plane flagship, traveling around the country to support starting aviation programs in schools.

One Build A Plane project is taking place at Hooper Bay High School in Alaska in partnership with FAA's AVSED Program. The village is more than 500 miles from the nearest road and students are building a light-sport aircraft. The components to build their project, a T-211 *Thorpedo*, were flown from the IndUS Aviation factory in Bangalore, India, by Federal Express to Anchorage, where local airfreight haulers took it the rest of the way.

For more information about Build A Plane, to start a project or donate an aircraft, log onto BuildAPlane.org, or call (804) 843-3321.

Jodi Ann Cody is a freelance writer.

MARTIN BAILEY

Nuts, Bolts, and Electrons

Avoiding Risky Business

System Safety for Repair Stations

An airplane is a machine that results from careful design, engineering, and production. Mindful of their utter dependence upon this machine, most pilots and aircraft owners are very conscientious about the maintenance of their aircraft. But no matter how carefully the machine is designed, operated, and maintained, it is a fact of life that machines sometimes break. When such things happen, whether to a general aviation aircraft or to an airliner, what assurance do we have that the repair facility is qualified and competent to perform the necessary repair work?

What assurance do we have that the repair facility is qualified and competent to perform the necessary repair work?

If your answer includes the words "FAA oversight," you are partly correct. Organizations that the FAA approves for the performance of aircraft maintenance are certified and regulated under Title 14 Code of Federal Regulations (14 CFR) part 145, which addresses a range of regulations related to the operation of repair stations. The FAA uses a number of methods and tools to ensure the continued operational safety of repair stations certificated under 14 CFR part 145, including periodic inspections. You should also know that the FAA has also developed a broad "system safety" approach to this important responsibility.

What Is Risk Management?

A key part of a system safety approach is risk management, which requires the ability to identify hazards, analyze and assess risk, and then design and implement controls of those hazards and risks. If you aren't familiar with the term, a *hazard* is a present condition that can create *risk* of some consequence in the future. For instance, a nick in the propeller of a parked airplane is a hazard. Risk arises if the airplane is flown in this condition, since a crack in the prop can lead to blade fracture or other problems.

How Does the FAA Apply Risk Management?

The FAA uses two risk-management tools in the oversight of part 145 repair stations. The Repair Station Assessment Tool (RSAT) is used in risk assessment and resource management. The Risk Management Process tool (RMP) provides a means to identify hazards, assess the risk posed by those hazards, and initiate an action plan to mitigate that risk.

The FAA's risk assessment process begins with the Base Surveillance Program, which lays the groundwork for inspection criteria and ensures that all aspects of part 145 repair station operations are considered. Next comes development of a Repair Station Profile, which provides information for an analytical review of a repair station. This profile helps the FAA's principal inspector (PI) for the facility move to the Repair Station Assessment Tool. The RSAT helps identify areas of concern about a specific repair station and prioritize work.

The next tool is the Risk Management Process tool (RMP), which takes the process a step further. The following example shows the five-step RMP process in action:

Step 1: Hazard Identification
Working outside in extreme cold or heat.

Step 2: Risk Analysis and Assessment
Performing maintenance in extreme conditions could contribute to a task being overlooked resulting in a possible aircraft accident.

Step 3: Decision Making
The repair station decides to move the maintenance to a maintenance hangar.

Step 4: Implementation
The repair station builds a hangar to provide a controlled environment.

Step 5: Validation
Better working conditions eliminate environmental safety risks, which positively affects aircraft maintenance quality control.

H. Dean Chamberlain photo

Hazard Identification —Mechanics working in extreme heat conditions that can contribute to an undesired or unplanned event.

How Does Risk Management Help You?

Benefits of the FAA's systematic approach to risk management include:

- More standardized inspections
- A more thorough look into repair stations' systems
- A closer working relationship between the repair station and the certificate-holding district office (CHDO)
- A clearer baseline comparison for repair station performance

By using FAA's risk assessment and management tool and by working through issues systematically we can help eliminate risks and increase the level of safety—ensuring you always have wheels (or wings) underneath you when you need them the most.

Martin Bailey is the manager of Flight Standards Service's Repair Station Branch.

H. Dean Chamberlain photo

Implementation — A hangar is built to provide a controlled environment and mitigate the identified hazard.

For More Information:

System Safety Handbook
http://www.faa.gov/library/manuals/aviation/risk_management/ss_handbook/

System Safety Course Developer's Guide
http://www.faa.gov/education_research/training/fits/training/flight_instructor/media/Volume2.pdf

Taking off with any contamination reduces the already small stall margin and climb performance.

Dave Swartz photo

The Chilling Truth about Aircraft Limitations in Icing Conditions

PAUL PELLICANO

On January 26, 2006, a Cirrus SR-22 was en route to Orlando, Florida, from Birmingham, Alabama, on what seemed to be a routine flight. Yet, what happened was hardly routine. After takeoff the SR-22 pilot was cleared to 7,000 feet, entering the cloud layer at 5,000 feet. At 7,000 feet, the aircraft encountered icing conditions. The pilot requested and was cleared to climb to 9,000 feet, and at 8,000 feet encountered VMC conditions.

Bullet dodged, right? Wrong. After busting the cloud layer, the pilot noticed buffeting of the controls and noticed his airspeed—80 knots! A stall ensued followed by an altitude-depriving spin back into IMC. Fortunately, the pilot was able to deploy a life-saving ballistic parachute system before his aircraft descended into the trees.

What can we learn from this? On review, two things are strikingly apparent. Although the pilot retrieved a weather briefing the night before this ill-fated flight, a critical update was missing. A more current briefing would have included an advisory for icing and precipitation along the selected route.

Also, implementing a timely and workable exit strategy is critically important. Knowing the temperatures aloft, cloud bases and tops, minimum enroute altitudes, and alternate airports along the route (with weather above instrument approach minimums and ice-free clouds) are key components of an icing strategy. Updating weather once aloft through PIREPs, ATC, or Flight Watch will help you keep the best options available. This is especially true when conditions are changing.

What causes accidents in icing conditions?

Aircraft icing is a key aviation safety issue, especially in winter. Accident data show that,

whether intentionally or not, pilots are flying aircraft not certificated for flight in icing conditions into such weather, often with fatal results. The good news is that since the early 1990s icing accidents involving aircraft not certificated for flight in icing conditions have been steadily decreasing. Unfortunately, however, accidents involving aircraft certificated for flight in icing conditions have not decreased. In the last three years there were five fatal accidents due to icing, and there are, on average, eight icing-related accidents per year.

Icing accidents are often the result of poor understanding of the airplane's limitations and performance in icing conditions, misconceptions of airplane and system icing certification, incomplete pre-flight weather briefings, and a misunderstanding of icing terminology. This article explores icing certification and how it might relate to your next flying experience.

What certification testing is done?

What certification testing is done to show airplanes without ice protection equipment can safely exit an inadvertent icing encounter? The answer is simple: NONE. There are only requirements for engine-induction icing and pitot and static source ice protection for IFR-approved airplanes. Most icing encounters are of low water content and drop size, so if you have safely exited one encounter, or hear hangar talk that your airplane is okay in icing, don't gamble that the next encounter will have the same result.

What should I know about airplane icing certification?

Standards used to certificate airplanes for icing do NOT cover all icing conditions. The standards only cover some of the forms of moisture that can exist in clouds. Icing conditions can overwhelm your ice-protection systems. Certification standards also assume you will hold in icing conditions fewer than 45 minutes. Pilots of aircraft certificated for flight in icing conditions should not be casual about such operations, particularly extended flight.

More importantly, the certification standards do NOT include freezing drizzle or freezing rain, also known as supercooled large drops (SLD). SLD will impinge further aft on the wing and tail, forming ice behind deicing boots or other types of ice-protection systems. The aerodynamic penalties can be larger than with ice that forms on leading edges. As a result, no aircraft or deicing equipment is certified for flight in SLD. A tragic example of flight during SLD icing conditions is the 1994 fatal accident of American Eagle Flight 4184 in Roselawn, Indiana. The aircraft, an ATR-72 turboprop, was certificated for flight in icing conditions.

Learn the cues and exit procedures for severe icing on your airplane. If your airplane's Pilot's Operating Handbook (POH) or Aircraft Flight Manual (AFM) does not have any, consult Advisory Circular 91-74A "Pilot Guide: Flight In Icing Conditions," for cues and exit procedures that you can use. It is also important to look for indications of freezing drizzle and rain, such as drops that splatter on your windscreen. In a certification flight test of a single-engine turboprop, for example, the only indication of SLD that produced nodules of ice covering the underside of the wing was a noticeable increase in required power to maintain the approach glideslope.

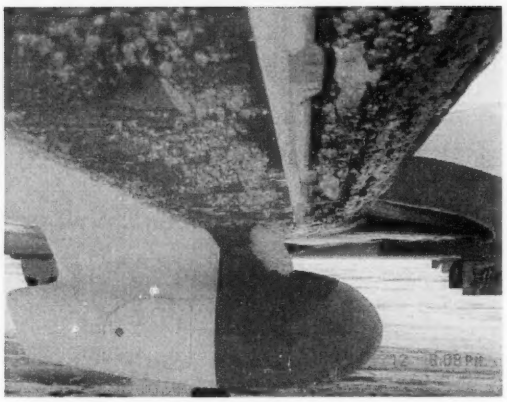
Icing certification standards have changed dramatically over the years. Prior to 1973, small airplanes were not required to be tested in icing conditions or analyzed or tested to the icing condition standard used today. The standards have changed significantly, even in the last few years. Advisory Circular 91-74A provides a good history. The two major changes are in stall warning and climb performance:

Stall Warning. Small airplanes certificated prior to 2000 were given certification credit for natural aerodynamic stall warning (buffet) even if the airplane had a stall-warning system. Since ice buildup on the wing lowers the stall angle of attack, the stall-warning sensor might not provide warning in icing conditions. Therefore, pilots should:

- Know the POH/AFM minimum icing airspeeds and treat them as limitations, even if they are not in the limitations section. If your POH/AFM does not have minimum icing airspeeds, add 15-20 KIAS to your normal operating

For More Information:

Inflight Icing (free online course) -
http://www.faasafety.gov/gslac/ALC/course_content.aspx?cID=33



In one certification flight, supercooled large drops only accumulated under the wing, which would not be visible from the cockpit.

airspeed. This goes for all phases of flight, including approach and landing where most small airplane icing accidents occur.

- Treat any buffet or vibration as an impending wing stall.
- Limit maneuvering in icing conditions.
- You can use the autopilot in icing conditions that are not severe, but you MUST watch your airspeed. When ice starts building up on the airplane, and drag starts increasing, the autopilot's vertical mode will maintain altitude or vertical speed at the expense of airspeed. Accident data and flight tests have revealed the rate of airspeed loss can be rapid (we've seen a loss of 40 KIAS or more in less than three minutes) and cues have not been sufficient to make the pilot aware of the airspeed loss. The pilot should periodically disconnect the autopilot in icing to check for unusual trim or control forces.

Ice Contaminated Tailplane Stall. Consult your POH/AFM for maximum flap limitations in icing. As a general rule, avoid using full flaps in icing conditions. A no-flap landing should be considered to avoid a tailplane stall if landing distances permit (with the appropriate increase in approach speed). Do not use flaps for extended periods of time in icing conditions, such as holding. This will also help prevent ice accumulation on the upper surface of the wing, which is most detrimental to lift.

Climb Performance. Prior to 1993, there were no quantitative requirements for climb performance in icing conditions. An airplane certificated today is required to have enroute climb performance data in the POH/AFM if the airplane's service ceiling in icing is under 22,000 feet. Pilots should:

- Consider the climb performance of the airplane and the route's minimum altitude when determining routes and exit strategies in pre-flight planning. The airplane's climb performance will be degraded in icing conditions.
- Consider climbing or descending to escape icing. Typically, an altitude change of 4,000 feet will get you out of icing. However, don't assume you can climb with ice on your airplane.
- If you cannot climb to exit icing, do not fly below the minimum airspeed in icing. Exit by making a 180-degree turn.
- If you cannot maintain altitude in icing at your minimum airspeed, trade altitude to keep airspeed above the minimum airspeed in icing.

Flight Planning is Essential

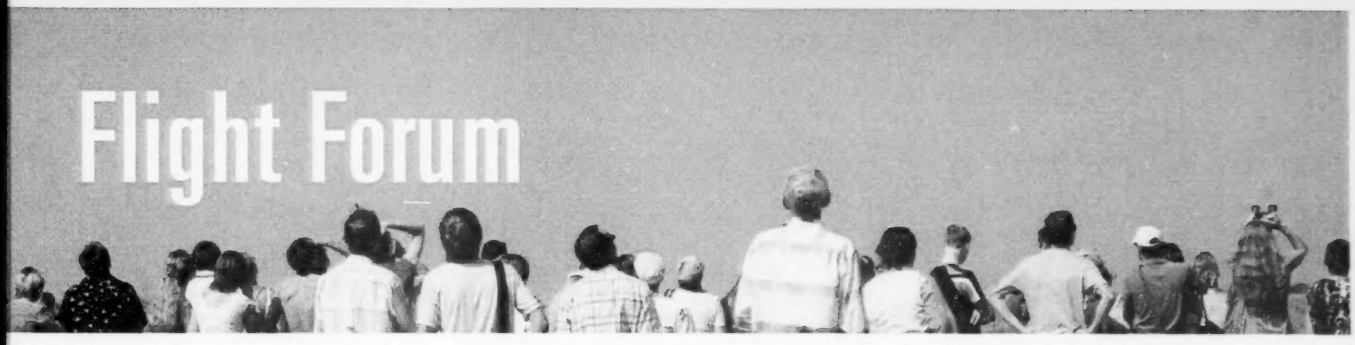
It is admittedly difficult for pilots to be certain whether conditions will result in an icing encounter because of the limitations of icing forecasts, and it is even more difficult to determine the severity of the possible encounter. A tool pilots should use to supplement their weather briefing prior to flight in known or forecast icing is the Current Icing Potential at http://adds.aviationweather.noaa.gov/icing/. Pilots can use it to determine altitudes and routes to help keep them out of high-probable icing areas, or, for a known icing-approved airplane, areas of SLD. PIREPS, Airmets, Sigmets, and freezing levels are also displayed graphically on this site.

Education is Key

Ultimately, education is the key to reducing aircraft-icing accidents. With an increased awareness of what your airplane can, and cannot do, along with a better understanding of how and why icing forms, you'll be able to make a safer decision on those cold, winter flights.

Paul Pellicano is an aerospace engineer in the Regulations and Policy branch at the FAA's Small Airplane Directorate in Atlanta, Georgia.

Flight Forum



Operations Lights On

Why hasn't the FAA established a firmer policy on the use of exterior aircraft lights? Instructors have always just said, "Turn on as many outside lights as possible (during the day or night) to make it easier to be seen."

Landing lights were normally used during all approaches and takeoffs, day or night, unless instructed not to by air traffic control or when clouds or fog created flicker vertigo, etc. However, after an aircraft has reached cruise altitude, landing lights on large air transport aircraft can cause moments of question. Standing outside at night before the moon had risen in the south, lights brighter than any stars or planets "appeared stationary" in the eastern sky. Since the aircraft was probably above 30,000 feet and approaching head-on, it took several minutes to perceive any movement, and before a flashing red light could be detected.

I do not believe in extraterrestrials, but still wondered what it was, even though I suspected it was only an airplane with its landing lights on. It has always seemed to me that the FAA, with all of its regulations on everything else, would at least have something in black and white on the preferred use of outside aircraft lights. Please let me know if it's something I probably just forgot, skipped over, never really learned, or, at least, where it can be found in today's FAA regulations or publications.

Best wishes from a fellow aviator,

— Ronald Dana Mackie
via the Internet

Thanks for your note. There are in fact references to FAA's lights-on policies and recommendations in several publications.

The Airplane Flying Handbook, *which can be found at http://www.faa.gov/library/manuals/aircraft/airplane_handbook/media/faa-h-8083-3a-5of7.pdf, has a reference on page 10-7.*

Section 4-3-23 of the Aeronautical Information Manual *(AIM) says the following:*

"c. The FAA has a voluntary pilot safety program, Operation Lights On, to enhance the see-and-avoid concept. Pilots are encouraged to turn on their landing lights during takeoff; i.e., either after takeoff clearance has been received or when beginning takeoff roll. Pilots are further encouraged to turn on their landing lights when operating below 10,000 feet, day or night, especially when operating within 10 miles of any airport, or in conditions of reduced visibility and in areas where flocks of birds may be expected, i.e., coastal areas, lake areas, around refuse dumps, etc. Although turning on aircraft lights does enhance the see-and-avoid concept, pilots should not become complacent about keeping a sharp lookout for other aircraft. Not all aircraft are equipped with lights and some pilots may not have their lights turned on. Aircraft manufacturer's recommendations for operation of landing lights and electrical systems should be observed." (AIM's Web site is http://www.faa.gov/airports_airtraffic/air_traffic/publications/atpubs/aim/.)

I hope this information is helpful to you—and that you continue to enjoy reading the FAA Aviation News*!*

Turbo Medical

How can I get a turbo medical form?

— JB
Via the Internet

TurboMedical is an Aircraft Owner and Pilot Association product. MedXpress is the FAA version and, if you want to create a MedXpress account, http://medxpress.faa.gov is its Web site. We also did an article on MedXpress in our Aeromedical Advisory in the May/June 2008 issue, which can be found at http://www.faa.gov/news/aviation_news.

To get basic information on FAA medical certification procedures, check out the following Web site: http://www.faa.gov/pilots/become/medical/.

SUSAN PARSON

Editor's Runway

Comings and Goings

Happy New Year! Here at *FAA Aviation News*, the new year has brought several changes to the magazine staff.

Managing Editor Lynn McCloud

Our new managing editor, Lynn McCloud, has many years of aviation and publications experience. At US Airways, she worked in the corporate communications department and launched US Airways Magazine. Lynn joined FAA in 1997 as the administrator's speechwriter. Drafting remarks for events such as AOPA Expo, Sun 'n Fun™, and EAA AirVenture® gave her a solid understanding of issues and concerns in the general aviation community. Lynn put this knowledge to good use when she moved to the Aviation Safety organization in 2004 as a speechwriter and communications specialist. Among other accomplishments, she launched two internal print and online publications.

The magazine welcomes our two newest crew members, Tom Hoffmann and Lynn McCloud

When we started the process of redesigning the *FAA Aviation News* a year ago, Lynn willingly contributed her knowledge, experience, creativity, and superb writing skills to the effort. For example, the "Jumpseat" and "FAA Faces" departments were Lynn's ideas, and most of the recent Faces profiles are the product of her pen. We are delighted that we were able to persuade Lynn to join us full time as the magazine's managing editor.

Writer-Editor Tom Hoffmann

Writer-editor Tom Hoffmann comes to us from Continental Airlines in Houston, where he had a wide range of responsibilities. These included serving as editor-in-chief of monthly, bimonthly, and quarterly publications for more than 14,000 flight attendants and pilots; producing internal promotional videos and multi-media presentations; overseeing the design and development of the departmental Inflight Intranet site; and development and technical support of FAA-required computer-based training (CBT) for more than 9,000 flight attendants.

In addition to his extensive experience in aviation journalism, Tom is an enthusiastic aviator whose credentials include a commercial pilot certificate with multi-engine and instrument ratings, an airframe and powerplant (A&P) mechanic certificate, and a degree from Purdue University's Professional Pilot and Aviation Business Management Program. Like most pilots, Tom lights up at the mention of his favorite subject, and we are excited to have the benefit of his enthusiasm and expertise. You'll be seeing Tom's work in these pages and those who attend some of the air show season's big events can look forward to meeting him in person.

Manager Julie Lynch

Julie Lynch, the manager of the Plans and Programs Branch for the last 21 months and the person ultimately responsible for the magazine, has moved to another manager position within the FAA. It was Julie's no-nonsense approach that catalyzed the changes over the last year to *FAA Aviation News*. She kept us on track with project management techniques and her insistence that collaboration yields a superior product. She actively sought out highly energetic, focused people (see above) to ensure the magazine continues to be a valuable source of information for our readers. We will miss her inspiration and leadership.

Safe flights and happy landings.

Susan Parson is a special assistant in Flight Standards Service's General Aviation and Commercial Division. She is an active general aviation pilot and flight instructor.

Pictured, from left to right: Jenna Silberman, Dr. Warren Silberman, pilot Richard Treat Williams, and AME Dr. Gary Ferris

Ken Krueger photo

FAA Faces: Warren Silberman

"It's a bird. It's a plane. It's Superman."

That was part of the opening of the 1950s "Superman" television show. Growing up in Philadelphia, young Warren Silberman was a big fan of all things Superman — movies, DC comics, and the TV show starring George Reeves, who disguised as the mild-mannered Clark Kent to this day (at least on DVD) "fights a never-ending battle for truth, justice, and the American way."

Dr. Warren Silberman still loves Superman and, as manager of FAA's Aerospace Medical Certification Division (AMCD), one could say his division fights a never-ending battle for truth, justice, and helping pilots get their medical certification.

Silberman's favorite belt (see photo) is a tribute to the strange visitor from another planet. When questioned about his "Krypton" fashion sense, Silberman, a doctor of osteopathy, retired Army commander, and holder of a master's degree in Public Health, responds, "The story is corny, but to do my job you need to be Superman. And, it's only a few letters off from my last name."

The job: Overseeing 120 employees who administer the aeromedical certification program for about 600,000 holders of U.S. pilot certificates. Every day, the AMCD receives about 1,700 applications for airman medical certificates. These add up quickly to processing some 430,000 applications each year. On top of the 1,700 daily applications, are the 28,000 requests for Statements of Demonstrated Ability and Authorizations for Special Issuance the division receives each year.

Yet, for Silberman and his staff, the objective is always the same: Managing risk and assuring that everyone who can safely get into the air is medically certified.

A physician and a private pilot with instrument and multi-engine ratings, Silberman holds a third-class medical. As a 250-hour civilian and 950-military-flight-hour pilot, he wishes he flew a P-51, but he does get out when he can in a Cessna 172.

On the ground, Silberman enjoys the company of airmen. He sought the FAA position after a U.S. Army career because, "I enjoy aerospace medicine and I love pilots." After joining FAA in 1997 he stayed on in the Oklahoma Air National Guard as Senior Flight Surgeon at its headquarters before retiring in 2005. He also served as the Oklahoma State Air Surgeon.

Silberman, whose team at FAA's Civil Aerospace Medical Institute in Oklahoma City has reduced the processing time of special issuances down to 30 days, is a familiar face of the FAA at air shows and AME seminars. He is a regular speaker at Sun 'n Fun™, EAA AirVenture®, and AOPA Expo.

Unlike Superman, who single-handedly fought villains in Metropolis, Dr. Silberman knows it takes a team to provide service to hundreds of thousands of airmen. His goal: Hire the stars who know what they are doing. His staff physicians are all pilots or former pilots; one was an Army flight surgeon. In addition, there's little turnover among his division's experienced staff.

If you spend any time with Warren Silberman, you will quickly see that while he cannot change the course of mighty rivers or bend steel in his bare hands, he advocates for airmen and manages resources to provide a crucial public service.

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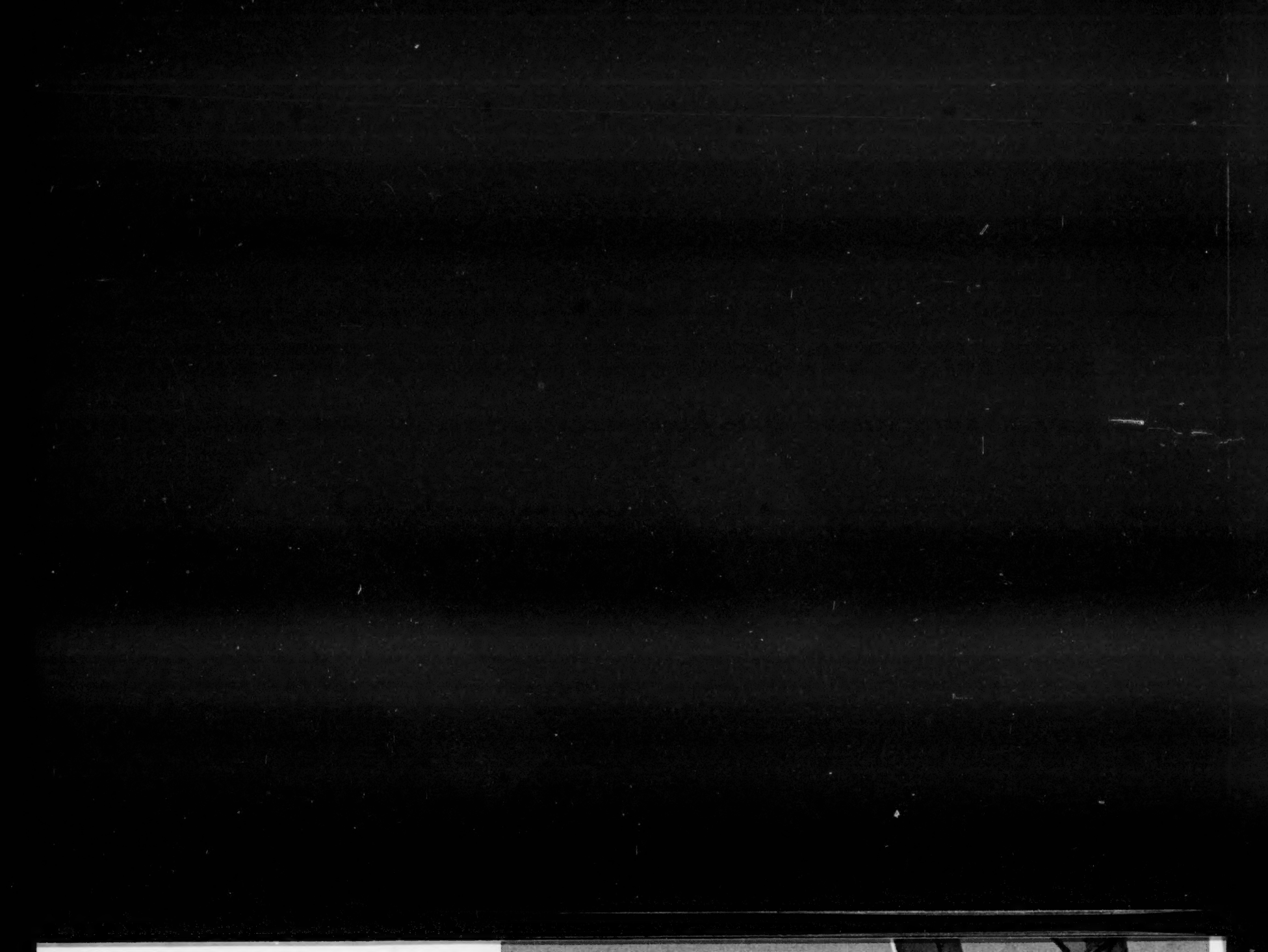
The FAA is an excepted service agency of the United States Department of Transportation. Starting salaries range from $39,795 to $75,025 (FG 9- FG 12) plus locality pay (Locality pay is a geographical enhancement to your base salary). For more information please visit http://www.opm.gov/. Benefits include federal retirement and 401K type accounts. Health and other insurances are also available.

Qualifications vary depending on discipline. For details, please visit http://jobs.faa.gov/. Under "All Opportunities" you can search by job series 1825 or title containing "inspector." Start your application today.